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AN

INTRODUCTION

TO THE STUDY OF

PRACTICAL MEDICINE;

BEING

AN OUTLINE OF THE LEADING FACTS AND PRINCIPLES OF THE SCIENCE,

AS TAUGHT IN A

COURSE OF LECTURES,

DELIVERED IN THE MARISCHAL COLLEGE OF ABERDEEN.

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CHAPTER I.

ON THE MORE SIMPLE FORMS OF DISORDER IN THE CIRCULATING SYSTEM.

Embracing the consideration of plethora, and of irregular distributions of the blood, producing local congestions:—More particularly as pathological and predisposing causes of several affections usually styled functional; and of inflammation, hemorrhage, dropsy, and other complicated forms of disease.

I.—PLETHORA.

General Pathological Characters.—That condition of the body, which consists in over repletion of the bloodvessels, and to which the above term has been applied, is most usually met with about puberty, and after the middle period of life. It is frequently associated with *the sanguineous temperament;* individuals, so constituted, usually displaying a very active and energetic state of the functions of digestion and assimilation. Other causes, however, commonly co-operate with this inherent or constitutional predisposition, in favouring the production of plethora. Of these the most obvious are—indulgence in undue quantities of stimulating and nutritious food; the use of malt liquors; sedentary and inactive habits of life; interruption and retention of the secretions and excretions, particularly of those which are eliminated from the skin and mucous surfaces.

Persons who exhibit a state of plethora, although frequently robust and athletic, are by no means always so, in the degree which their external aspect would seem to indicate: a fact which requires to be adverted to in conducting the treatment of the diseases which plethora may induce, or with which these individuals may, from other causes, become affected.

Every one who is in a state of plethora, however, is not therefore to be considered as actually in a state of disease; for, in its minor grades, it is only to be viewed as a condition of the system favourable to the operation of certain exciting causes of disease which might not otherwise take effect. For example, it gives a predisposition to gout and apoplexy; heightens the violence or acuteness of all inflammations; and gives to every other disease with which the individual may be attacked, a *phlogistic* or inflammatory tendency.

But in this state of the vascular system, besides excess in the quantity of the blood, there is generally also an excess of its *fibrine* and *red globules*, whereby it is possessed of a more stimulating and nutritive property. And thus, plethoric persons are, as respects both the quantity and quality of the fluids, in a condition the very opposite of that which prevails in ANÆMIA :—which, though more frequently the concomitant or consequence of a preexisting disease, especially of malignant tumours—of chlorosis—scorbutus—purpura, and other states of the general system, which have been usually classified by Nosologists under the head of cachectic diseases—is nevertheless sometimes a primary and independent (Idiopathic) morbid condition : in which case the anæmia may be owing to accidental inanition, improper food, depressing passions, want of invigorating air and exercise, absence of solar heat and light, (circumstances which appear adequate to the production of scurvy and purpura apart from the use of salted provisions,) and probably also to certain conditions of the nerves of organic life concerned in the process of assimilation. Accordingly, in consequence of excess in the quantity and quality of the blood in one case, and deficiency in these respects in another, the different functions of the body will either be subjected to undue stimulation, or to a defective excitation. Whence the nutrition of the body will be excessive in the former instance, and manifestly defective and atrophied in the latter ; and whence, also, the treatment applicable to the one and the other of these conditions of the vascular system, will, in most, though probably not in all particulars, be directly opposite :—tonic remedies and tonic regimen being indicated when anæmia, simple or complicated, is present ; while for plethora, moderate depletion and other antiphlogistic measures will be required. Although, in either case these respective modes of treatment must not be urged too far or too precipitately ; seeing that plethora is by no means invariably associated with strength of constitution, nor anæmia, purpura, and scorbutus (though in their general character asthenic disease,) always free from increased action of vessels, tending to inflammation.

When the plethora is great, and has been of some duration, a certain deviation from the strictly healthy actions of the system will generally be observed to take place. In which case there will arise (often independently of any other obvious cause,) certain minor derangements of function ; of which the following are some of the most usual indications :—General oppression ; languor and lassitude ; listlessness and inaptitude for mental and corporeal exertions ; an easily accelerated circulation—the pulse being commonly quicker, fuller, and less compressible than in perfectly normal states of the system ;—and as the functions of the nervous, as well as of the vascular system are oppressed, the whole secretions and excretions of the body become irregular and defective, thereby adding to the plethora.

But should this undue excitation of the different organs and

functions of the body continue, local congestions of blood will likely be produced—(in the brain, lungs, stomach, or liver, for example,) ending probably in hemorrhage, dropsy, or inflammation; and in which event a new set of symptoms will arise to indicate the particular seat of the affection.

But it is when a degree of debility of the moving powers of the blood has succeeded to this general stimulation of the system—when the circulation has become slow and languid, the pulse variable, preternaturally slow and labouring, (the patient still probably continuing to exhibit in his person little appearance of weakness,) and especially when other causes combine, such as cold and wet, mental and corporeal fatigue, that local congestions are most liable to supervene.

II.—LOCAL CONGESTIONS.

General Pathological Characters.—By the above terms is properly understood not only the over distention of the smaller arteries, veins, and capillaries of a part, from partial and preternatural accumulations of blood, but also a retarded and impeded circulation through these vessels; thereby implying a deficiency, general or local, absolute or relative, in the powers of the circulation, which may spring from original or congenital weakness of the part, or from a debility which may have been induced by the operation of various causes; but the precise mode of whose operation it is not always possible to trace with accuracy. All causes of irritation, whereby the vital actions of a part have been inordinately excited, will be productive of that state of the minute vessels to which I now refer; for ultimately, in all cases, a feeble and defective performance of the functions of a part will be the consequence of continued and excessive exercise, or stimulation of that function. Thus, an habitual excess in eating and drinking may induce the various symptoms of dyspepsia;—symptoms which are often connected with congestion and chronic inflammation of the mucous coat of the stomach. And again, excessive study, anxiety, &c. may occasion mental confusion, wandering of the intellectual faculties, delirium, and other symptoms of cerebral congestion:—while heat, which first excites the actions of the liver, may, by continuance, induce a congestion of this viscus, followed by disorder of the biliary secretion, ending, (according to the peculiar circumstances of the case,) in diarrhœa, cholera, or jaundice. But in the majority of instances, it will be found that some one organ of the body is naturally of more delicate organisation than the rest, and is consequently in a condition less able to resist the ordinary exciting causes of disease.

This susceptibility of particular organs in different individuals to be affected by the ordinary causes of disease, is not unfrequently connected with a peculiarity of conformation, which is hereditary, and which appears also to give to that organ a predisposition, or

susceptibility, to one form of diseased action in preference to another; as is occasionally exemplified in the case of two or more individuals, who having been exposed to the same exciting causes, under precisely the same external circumstances, become affected with cerebral congestion; which assumes in one the form and character of mania; in another that of apoplexy; and in a third that of cerebritis.[1]

Local congestions, then, may arise not only in connection with local debility, but also in connection with debility of the system generally, *i. e.* in connection with a state of ASTHENIA. The congestions which originate under the latter circumstances are very generally of the purely *passive* kind, proceeding simply from gravitation of the blood into the more depending parts of the body; and have been termed accordingly HYPOSTATIC congestions. And as hypostatic congestions occur in the course of many chronic affections, when much debility prevails—and particularly, towards the fatal termination of diseases, where the sinking has been gradual, and the dying struggles protracted, (as also after death)—some of the congestions of this class are, in reference to these latter circumstances, designated CADAVERICAL or POST MORTEM congestions; and the "CONGESTIONS of the DYING"—the "*congestions des agonisans*" of the French pathologists.

The habitual posture of the patient will greatly determine the parts which will be likely to assume the state of HYPOSTATIC congestion, during a lingering disease. And attention to the position of the patient may lead to their detection when forming during life, in the lungs, or other viscera of the great cavities; and so enable the physician to anticipate or counteract them by change of posture; and also to distinguish them in the dead body from the effects of genuine inflammation.[2]

[1] These general observations, in regard to predisposition and the manner in which the vessels of a part are brought into a state which favours congestions of blood, will be equally applicable towards explaining the mode of formation of many of the cases of inflammation which are styled *subacute* and *chronic*;—such forms of inflammation being usually, indeed, preceded by congestion.

[2] The passive congestions here alluded to are very liable, when they have continued for some time, and when they have become excessive, to induce a low and latent form of inflammation—or rather what might be termed an *irritative* or *active* congestion; but which, under the circumstances of the case, is equally destructive with true inflammation; since it generally terminates in extensive softening and disorganisation of the tissues, or in the death of the patient. The supervention of a local increased action, productive of consequences such as these, is most frequently observed in the case where a hypostatic congestion has taken place in the base of the lungs, in consequence of the patient having been confined, for a length of time, by age and debility, to the recumbent posture; and particularly, in the latter stages of contagious diseases, and bad idiopathic fevers, where the debility or exhaustion has been preceded by excitement of the general system. A state resembling gangrene is not unfrequently observed in the parenchymatous viscera—(lungs, liver, spleen, &c.) of those dying under such circumstances;

Further, as congestions may be produced by causes which mechanically impede or obstruct the flow of blood towards the heart; so the congestions which proceed from this cause are termed MECHANICAL congestions. They belong, like the former, to the class of *passive* congestions; and greatly predispose to serous or dropsical effusions. Lastly, congestions may be produced by an increased action of the vessels, general or local, *i. e.* by an irregular determination or afflux of blood (as it is called); the congestions which originate in this way being styled ACTIVE congestions.

Division.—Congestions have been accordingly divided into ACTIVE and PASSIVE, and into STHENIC and ASTHENIC. The former division refers to the presence or absence of increased action in the vessels of the part, or in the system generally; and the latter, to the strength or weakness of the general constitution of the patient; which is a feature of much importance in the practical consideration of this and every other class of diseases. Passive congestions are also occasionally styled venous congestions, from the veins being more loaded in such cases with blood than the extreme arteries.

Active congestions, though more frequently connected with a plethoric condition of the system, are not necessarily so. On the contrary, active as well as passive congestions may occur in states of the system where there is a defect both as respects the quantity and quality of the circulating fluids. Again, while active congestions are nearly allied to inflammation and hemorrhage, passive congestions are frequently connected with dropsy. Active congestions are understood to be preceded by an increased flow of blood towards those capillary arteries and veins which are afterwards the seat of the congestion;—a flow of blood which may be produced by causes (presently to be mentioned,) whose action may be either confined entirely to the capillary system, or may operate as a stimulus to the heart and arteries generally. But in passive congestion there is no increased action of the vessels, general or local; on the contrary, there is a state of depression of the vascular actions.

The characters of active and passive congestions are, however, in many cases, blended, and by no means always very specific; for any increased action which may have been present at first, and which might have assisted in forming the congestion, is very often entirely local; or if it extend to the heart and arteries, it will seldom be found to exceed a transient febricula; excepting in young children, and irritable constitutions, where slight congestions and functional disorders not unfrequently give rise to much constitutional excitement, and pretty severe attacks of fever, in the course of which the congestion is very apt to lapse into subacute inflammation, involving the patient in great danger. The subacute inflam-

and which is probably the consequence of hypostatic congestions, which, by their presence, had excited irritation, followed by some degree of local increased action of the vessels.

mations of the brain (Hydrocephalus,) and of the mucous membrane of the bowels, which are so frequently seen to arise in children of scrofulous constitution, very generally commence in this way.

It appears, then, that the majority of congestions are attended at first with some degree of increased action, local or general (more frequently the former only,) to which a *diminished* action succeeds; *i. e.* there is a *stage* of increased action with local determination of blood, and a *stage* of diminished action with accumulation of blood, distention of the capillaries, and retarded circulation of the part. In many of the milder examples of congestive disease, a correct diagnosis as to the active or passive nature of the affection can be obtained only by careful consideration of the general or *constitutional* powers of the patient, and of the particular nature of the exciting and predisposing causes. Lastly,—Congestions are either PRIMARY or SECONDARY; *i. e.* they sometimes arise in the course of another and a pre-existing disease; for example, in the course of idiopathic fevers—the exanthemata, and the remittent fevers which appear in children in connection with gastric irritation, dentition, &c.[1] Secondary congestions are, especially, liable to occur in those of an irritable and enfeebled habit of body; and are altogether much more frequent than primary congestions. The primary may disappear when the secondary congestion is formed, but more commonly they proceed *pari passu*.

Remote Causes.—Besides general plethora, and the states of the constitution already referred to as predisposing to local congestions, the following also appear to be occasional exciting, or predisposing causes.

First:—All irritants, local and general, *i. e.* agents which possess the property of stimulating or exalting the vital actions of the system, or of a part—comprehending the various chemical and mechanical excitants, and the different organic lesions (tubercular, ossific, and granular deposits,) which, by their presence, keep up a constant irritation in the system, and in the organs in which they are situated.[2]

The causes included under this head are generally productive

[1] A primary congestion or a subacute inflammation of the intestinal mucous membrane (which may have resulted from vermination, or from the presence of vitiated and irritating mucous secretions, and indigestible and feculent matters in the primæ viæ,) will often be succeeded by a cerebral or spinal congestion, producing convulsions or ending in hydrocephalus: and, in like manner, a primary congestion of the cerebro-spinal organs will often be followed by secondary congestion of the mucous membrane of the intestines; and which may, in its turn, give rise to severe vomiting and diarrhœa, or issue in an actual gastro-enteritis. Both of these cases are of frequent occurrence in practice, particularly in young children, and in hysterical and nervous sensitive females.

[2] While these formations are, in some instances, concerned in the *causation* of congestions and inflammations, they are at other times, and under other circumstances, the *effects* (in part at least) of the less active and acute forms of inflammation.

of the acute and active form of congestion, which approximates to inflammation.

Second:—Habits of indolence and over-repletion; especially when practised by individuals who are naturally sluggish and inert, whose powers of circulation are languid and feeble, and in whom the secretions and excretions of the body are sparing and defective. The persons who exhibit this general want of energy in the functions of animal and organic life are said to be possessed of the *phlegmatic* temperament. And it is very probable that when such individuals indulge in laziness, and in gross feeding, the blood becomes vitiated owing to the retention of the excrementitious matters; in consequence of which vitiation it is also probable that a general irritation will be created in the system, which, together with an increasing plethora, ultimately occasions local irritations and congestions; which, in persons of this habit of body, commonly end in serous or dropsical effusions.[1] It is under such circumstances, and in such states of the constitution, that many of the more *chronic* congestive affections take their rise. For example—the congestions of the mucous membrane of the stomach, producing symptoms of dyspepsia, constipation, and other irregularities of the bowels;—of the mucous lining of the uterus, producing amenorrhœa;—of the spinal chord, roots of the nerves, or ganglionic system, producing the varied symptoms of hysteria, hypochondriasis, and other distressing affections, whose real nature is often obscurely indicated by the external phenomena; but which, in pursuing a chronic yet uninterrupted course, not unfrequently leád to irremediable organic changes, ending in dropsy.

Third:—Physical impediments to the return of the blood by the veins; such, for example, as will arise from hepatised or tuberculated lungs, granulated liver, valvular disease of the heart, &c. The congestions connected with causes of this description are very liable to be succeeded by inflammation of the serous membranes, and watery effusions; whereby a consecutive dropsy will be established.

Fourth:—Impulses given to the general circulation by agents acting suddenly and powerfully on the nervous system, and through it, on the heart and arteries; for example—intense moral or physical impressions, painful operations, and severe injuries and accidents, happening, especially, when the system is in that condition which has been styled "*irritable;*"—a condition which may be induced by habitual indulgence in powerful stimuli, more particularly ardent spirits and opium; also by a continuous and intense application of the mind to objects of interest—protracted anxiety, want of sleep, great corporeal fatigue, and violent muscular efforts; and which is not unfrequently also (to a certain extent,) original or

[1] The effusions, in this case, are generally of the class styled "primary and idiopathic dropsies."

connate, being nearly allied to, if not identical with, what is usually designated "*the nervous temperament.*"[1]

Fifth :—Exposure to sudden and extreme cold or heat. From both of these causes apoplexy, for example, may be induced; while severe congestion of the liver, and intestinal mucous membrane, followed by bilious cholera or diarrhœa, is very liable to be caused by a continued application of the latter, in the form of solar heat.

Sixth :—A state of *sudden* debility and exhaustion; particularly where this has been produced by copious or frequently repeated abstractions of blood, by spontaneous or accidental hemorrhage, purging, and other direct modes of depletion.

The congestions which arise under such circumstances are (notwithstanding the state of exhaustion,) more frequently active than passive, and prove, in general, extremely dangerous to the life of the patient. I may here observe that much will depend upon the state of the constitution, and the number and nature of the causes which may co-operate, in a given case, to the production of the effect, whether the congestion will assume the ACTIVE or PASSIVE form; also whether it will be likely to pass quickly into inflammation, or issue in a serous or bloody effusion. Thus, from a congestion of the lungs, hæmoptysis may result, or œdema, or an actual pneumonia; or even a fit of asthma, in particular conditions of the pulmonary nerves.

But in all cases of severe congestions, situated in important organs, it is probable that several causes have combined in order to their production. The continued operation of which causes at length induces inflammation, hemorrhage, or dropsy.

The *modus operandi* of the foregoing causes, in the production of irregular determinations of blood, and consequent congestions,

[1] The nervous or irritable constitution is more commonly met with, and also more fully developed, in women and children, than in males and adults. It is that in which the vital powers of the system are easily roused and excited to increased action, but which are ill sustained under a continuance of excitation;—the nervous and vascular functions soon falling into great irregularity. Individuals so constituted, are more easily affected by the ordinary exciting causes of disease, and consequently more obnoxious to it, and especially to a subacute degree and form of inflammation; the injurious effects of which they are at the same time less able to resist. It may here likewise be observed that owing to this predominating influence of the nervous system, and facility with which it is thrown into irregular excitement, such individuals are possessed of a strong disposition to be affected by certain anomalous and painful diseases, which are vaguely classed under the head of Hysteria, and still more vaguely by some under the latitudinarian phrase of "nervous disorders;"—disorders which are, in many cases, however, connected with congestion, and prove most harassing to the patient, and baffling to the skill of the physician—being at one time acute, and simulating many of the phenomena of inflammation—at another time chronic, and then, assuming many of the features of organic lesions; and in all cases requiring the greatest care and tact in forming a correct diagnosis, seeing that the more active measures of an antiphlogistic kind are not admissible in the treatment of these hysterical and neuralgic affections.

would appear to be threefold:—1st, By acting on the heart and general circulation, either directly or through the medium of the general sympathies of the nervous system; 2d, By acting on the extremities of the vascular and nervous systems—thereby augmenting their vital properties and actions, and thus accelerating the flow of blood in the extreme vessels of the part; and 3d, By diminishing the flow of blood in one part, and increasing it in another; as may happen, for example, when cold and moisture are applied to a considerable portion of the surface of the body, or to the feet and extremities.[1]

In the truly PASSIVE, MECHANICAL, and HYPOSTATIC congestions, the mode of causation is, however, different. A stasis of the blood takes place chiefly in the venous extremities, owing to the opposing force which a superincumbent column of blood exerts against the return of the venous current, in the more depending organs of the body, and parts of organs; while the heart and arteries, from general weakness or otherwise, fail to communicate the necessary impulse to the blood, moving through the capillaries.

Certain structures and organs of the body are more liable to become the seat of congestion than others: these are, more especially, the mucous membranes, the lungs, brain, uterus, and kidneys; and all organs whose function is secerning.

The peculiar liability of these organs to congestion appears to be more particularly referable to two circumstances; namely, their superior vascularity, and the frequent, sudden, and great variations in the absolute quantity of blood which is circulating in their vessels at different periods;—variations which take place in conformity with the physiological laws which regulate the functions of these organs. I allude here particularly to that degree of increased activity of the vessels and afflux of blood, which is compatible with, and indeed essential to, the performance of the healthy functions of secreting organs:—a physiological congestion which is established at certain periods, in certain structures and organs of the body, in aid of the discharge of their particular functions, and which may be easily urged to morbid excess by very slight occasional causes. The injected state and appearance of the uterine and gastro-intestinal mucous membranes at one time, compared with the pale and exsanguious aspect which the same membranes present at another time, when a periodical suspension of the functions of these organs has taken place, may be adduced in illustration of the above-mentioned fact. And a similar variation will be

[1] It is in this way that diarrhœa is often produced, by exposure to the chills and damps of the evening of a hot day; the already partially congested state of the mucous membrane and liver, from the previous heat, being in this instance much increased by the sudden check given to the cutaneous circulation, from exposure of the body to a cold and moist atmosphere, and by the consequent determination of the current of the blood towards the mucous surfaces, with which the skin is continuous, and with which it maintains the most intimate physiological relations.

observed to occur in the state of the hepatic circulation, and in that of the other viscera formerly referred to, though somewhat less regularly.

There is a propensity at different stages of life to the formation of congestions in one set of organs or tissues of the body, in preference to others. Thus, for example, in infancy and early life, the brain and gastro-intestinal mucous membrane are the most frequent seats of active congestions and inflammations, and the lungs about puberty; while, again, in advanced life, congestive disorders of the genito-urinary organs are much more common than they are found to be prior to this period.

The congestions which happen in the earlier and middle periods of life very generally assume more or less of the active form, readily merging into inflammatory action; while those which occur in the aged and enfeebled are more commonly of the passive and asthenic form, or at least become so, after a very transient and imperfect active stage.

The disposition, evinced at the different periods of life, to the formation of particular congestions, would seem, together with the last mentioned circumstance, to be explicable by a reference to that principle or law of the animal economy which regulates, in early life, the developement and growth of the respective organs and systems of the body; and which, again, in the decline of life, by a partial suspension or declension of the functions of the nutritive vessels, effects a change in the relative extent or calibre of the two systems of blood-vessels—the arteries and veins;—an additional source of difficulty to the free transmission of the current of blood through the capillary system being, at the same time, caused by the not unfrequent transformation of the coats of the arteries into a steatomatous and bony matter. The area of the capillary system of the brain will, for example, in consequence of this organ having attained its full developement about puberty, become greatly contracted, so that any determination or undue propulsion of blood towards the head at this period will generally cause congestion of the Schneiderian membrane, followed by epistaxis: while, again, as life advances, all increase being at an end, and the nutrition of the different tissues having become imperfect, the whole capillary system of the body gradually contracts and lessens in its area or diameter; while, from a growing debility of the heart's action, and a rigidity of the arteries (owing to morbid deposition in their coats,) the propulsion of the blood through the system becomes more and more defective, until at length, being retarded in the extremities of the venous system of depending parts of the body, it forms VENOUS and PASSIVE congestions.

External Phenomena or Symptoms.—The particular or diagnostic symptoms of active and passive congestions will vary according to the intensity, the extent, and seat which they occupy. Much functional derangement will generally ensue whenever the congestion is extensive or suddenly formed, and when it occupies

an important or vital organ—the brain or lungs, for example. Of the more general symptoms, the following are the most prominent: sensations of chilliness, languor, depression of spirits, lassitude and sense of muscular debility, coldness of the extremities, with occasional paroxysms of excitement of the heart and arteries, assuming at times, the form of an irregular and imperfectly developed PYREXIA.[1]

Effects or Consequences of Congestions.—These are, *first*, Disorders of Function; which, by giving rise in some instances to a particular train and concourse of symptoms, constitute special diseases in the systems of nosology; for example—cases of epilepsy, apoplexy, mania, dyspepsia, and hysteria.

Second. Increase of the natural secretions and exhalations of the part.[2]

Third. Hemorrhage or effusion of blood.

Fourth. Hypertrophy or simple organic increase.

Fifth. Certain degenerations of structure and adventitious deposits—particularly the tubercular and granular.[3]

There are considerable difficulties in assigning a satisfactory reason, why, in one case, the congestion proceeds to inflammation—in another to extravasation of blood or serum—in a third, to a simple increase (without any other modification or apparent alteration,) of the natural secretions of the part;—and why, in a fourth instance, the congestion is easily removed by art, or disappears spontaneously, without these or any other consequences having ensued. There can be no doubt, however, that the seat, the future course, and the ulterior effects of every case of congestion are, in a great measure, determined by the following circumstances:—

[1] It is only when a congestion has been rapidly formed in an important organ, or when more than one organ is the seat of active congestions which have arisen simultaneously or consecutively—for example in the brain and lungs, or brain, lungs, and alimentary canal—that the febrile symptoms are observed to be well marked. Therefore, in the majority of cases where the congestion is induced more gradually, and where the case consequently pursues a more chronic course, the symptoms are as just stated: viz. a general and local oppression and sense of debility, with a small, frequent, and unequal pulse; furred tongue; deficient secretions; irregularity of the functions of the primæ viæ, generally with constipation—unless when the bowels themselves, the liver or stomach, happen to be the seat of the affection—in which case a variety of symptoms referable to these parts will be superadded. Local weight, heat, and a certain degree of uneasiness amounting even to pain, may occasionally form part of the symptoms of the *more active* and *acute* congestions.

[2] Here, as in the former case, the product of the morbid action may, from its magnitude and other accidental characters, take on the form of a distinct *nosological* affection, of the class usually designated "symptomatic."—For example, the form of a dropsy—a diarrhœa—leucorrhœa—catarrh—or other instance of what used to be styled by the older writers a "simple flux."

[3] Probably in the production of these latter effects, however, something is due to a certain degree of *inflammatory* action, often of a very low and subdued form, whereby certain changes are effected in the intimate vital actions subservient to nutrition.

1st. By the natural temperament and general constitution of the individual patient :—2d. By the fact of a particular organ of the body having acquired some defect or delicacy, or having otherwise departed from the normal or healthy condition, by reason of over excitement of its functions or peculiarity of original conformation : 3d. By the fact of congestion or inflammation having previously existed in the part; and, in consequence of which, it has suffered a permanent change of organisation :—4th. By the nature and particular mode of operation of the exciting and predisposing causes ; especially by the manner in which their operation and effects are modified by original constitution, and the presence of other diseased actions in other parts of the system ;—And 5thly, probably, by the condition of the blood, both as regards quantity and quality.

Post-mortem appearances of congestion.—Local determinations of blood cannot always be satisfactorily proved to have existed by a reference to morbid appearances in the dead body ; and such will even be the case sometimes where the congestion has been intense, and where it has been accompanied in its progress during life, by functional derangements and other well marked symptoms ; for example, some cases of apoplexy, mania, and epilepsy. For, in not a few of the examples of these decided congestive diseases, the increased vascularity and injected state of the tissues, which assuredly did exist before death, will be found to have entirely vanished, leaving no traces of having ever existed ;—though, in some of the instances where the redness and vascularity have thus disappeared, we meet with extravasated blood and serum, affording better evidence of the previous existence of congestion (or of inflammation,) than could be derived from mere redness or increase of vascularity. But neither ought increased vascularity, nor effusions of blood or serum, to be held as sufficient proof of the previous existence of a pathological congestion (and still less so, of inflammation.) since all these appearances may be connected with those passive accumulations of blood, distention of vessels, and simple transudations of blood and serum, which we find taking place entirely under the influence of gravitation and other physical laws.[1]

Therefore the evidence for the existence of an actual and pathological congestion,[2] as derived from post mortem examination, can

[1] While in the *dead* body the ordinary physical laws alone prevail, it is necessary to remember that they also acquire a greatly increased influence during the *latter* moments of life ; tending, on that occasion, to predominate over those vital laws which control and regulate the distribution of the blood, and which, in states of greater vigour and integrity of the system, prove sufficient to counteract the gravitation of the fluids, as well as the *ordinary* chemical laws of decomposition. And the same thing happens in all cases where much debility prevails, and more particularly where the debility is the consequence of typhoid fever, or other malignant and contagious disease ; hence the dread of putrescency entertained by the older writers in such cases, and not altogether without reason in some bad epidemics.

[2] The observations which are here made in regard to the fallacy of viewing increased vascularity of a part, as possessing the characters of a *positive*

only be satisfactory when, 1st. The appearance of an increased vascularity and redness is not altogether confined to depending situations; but when, on the contrary, the minute arteries and capillaries of the superior and least dependent portions of a membrane or organ are found highly injected; as for example—the edges and upper surface of the lungs—superior parts of the gastro-intestinal mucous membranes—or of the membranes investing the anterior and superior portions of the brain.—2d. When the vascularity is not limited to veins, or to branches of arteries whose diameter, in the natural state, might be considered of sufficient size to circulate red blood; but where, on the contrary, the very minute and delicate colourless vessels are found penetrated with red blood;—3d. When the redness is of the florid or arterial hue, rather than of the dark venous shade; the latter being more characteristic of turgescence of the venous system, *i. e.* of a congestion which is the consequence of a stasis of the blood from the force of gravitation, or from a mechanical obstruction to the circulation—(the simple HYPOSTATIC and MECHANICAL congestions);—4th. When, in the absence of any unusual vascularity or injection of the capillary vessels of a part, there is found to be a more than ordinary quantity of a serous or bloody fluid deposited;[1]—5th. When, looking to the posture of the body generally, and of the different viscera in particular, as well before as after death, there is no ground for supposing that the position could have materially favoured the formation of a hypostatic congestion;—*Lastly*, When all the foregoing particulars coincide, and when—by a careful review of all the symptoms during life, and consideration of the manner of the patient's death, *i. e.* whether it was sudden or gradual—in the way of asphyxia, coma, or simple exhaustion[2]—there is no contradiction in, but, on the contrary, a confirmation of the preceding evidences.

evidence for the existence of a previous *morbidly* increased action of the vessels, are equally applicable to inflammation, as to the present subject; and the same with the observations which immediately follow in regard to certain circumstances, from the attentive consideration of which we are most likely to arrive at a correct conclusion in respect to the source and origin of this post mortem appearance in all doubtful cases.

[1] Did not the effusions, which are the result of increased and altered action of the vessels, again offer themselves for consideration in a subsequent chapter, it would probably be necessary in this place to be more specific in regard to them; and, in particular, it would be requisite to give the student some notion of the quantity of serous fluid which may be occasionally found occupying the shut cavities of the body without its being referable either to previous inflammation, congestion, or other diseased action. But this, as well as the particular situations which a serous effusion must be found occupying in a cavity or organ of the body, before it can with propriety be set down as a *morbid product*, will be fully explained in the second part of the course, in connection with the pathology of special inflammatory and congestive diseases.

[2] Death, by each of these modes, is well known to favour hypostatic congestion of particular organs. Thus, when the death takes place in the way of asphyxia, the vessels of the stomach, liver, and intestines, particularly the

After these general views of the pathology of congestive disease, it does not appear necessary to dwell longer on the important relation which local congestions and *simple* increased action of the vessels bear to inflammation, hemorrhage, and dropsy; nor does it appear requisite to enter into any detail at present, in order to show in what manner the presence of a local congestion will influence the progress and course of a variety of other diseases; especially the NEUROSES or those affections pertaining to the cerebro-spinal and ganglionic systems—a few of which (epilepsy, apoplexy, mania, hysteria, &c.) have been brought forward in the foregoing pages, in illustration of the text.

Not only, however, are irregular determinations and congestions of blood mainly instrumental in the production and continuance of the several diseases now specified, but they are also the frequent intercurrent sources of disease, danger, and death, during the progress of many other maladies; more especially the idiopathic fevers, and the whole tribe of chronic organic affections. It is very generally, indeed, in consequence of secondary congestions that idiopathic fevers become fraught with so much danger to the patient; particularly the remittent fevers which occur in the warmer latitudes, and some of the typhoid cases of continued fever which are met with during the epidemics of this country: death under such circumstances, and in such cases, being often speedily produced by the severity of the secondary congestions alone—no actual inflammation having taken place.

It is here, also, necessary to state, in order to enable the student to form a just comprehension of the principles set forth in this chapter, that while the affections, to which I have so often had occasion to refer in illustration, appear to be referable, in some instances, solely to a state of capillary congestion of the different organs and tissues, it must not, therefore, be inferred, that this is all that is present in *every* example or individual instance of these affections.

To adopt so simple a view of their pathology might be convevient to an exclusive theorist; but would be far otherwise than true; and altogether unsafe as a guide for the practical physician. It must not be imagined that diseases are in general so simply constituted and explained. The concourse of symptoms, for example, which are referable to disordered action in the brain and nervous system, and which have been agreed upon by nosologists as characterising and defining the diseases, respectively denominated apoplexy, palsy, and epilepsy, may, in place of being solely and simply dependent on congestion, and embarrassment or suspension of nervous function consequent thereto, be owing (though in a

mesenteric veins and whole system of the *venæ portæ*, will be found greatly congested; and the same is the case with the lungs, when there has been, in consequence of a very feeble action of the heart for some time before death, a difficulty in transmitting the blood through their parenchyma.

way more remote,) to the presence of certain lesions of *structure;* such as, inflammatory softening, ossific deposits in the coats of the arteries, or in the investing membranes of the brain or spinal chord; or to tubercles and tumours of different kinds situated in the same parts. In such cases, congestion is probably, however, still the *immediate* exciting cause of the epileptic, apoplectic, or paralytic seizure—the organic changes now referred to, operating only as permanent and powerful predisposing causes of the former.

Nevertheless even this view of their etiology does by no means afford a full explanation of the intimate nature of these diseases, or of all the varied phenomena by which they are characterised; for the congestion itself can only be considered as an intermediate cause, something always being dependent upon an unexplained and hitherto unknown condition of the *innervation*, *i. e.* of the organic sensibilities of the tissues; a condition which, it is probable, consists in some minute and inappreciable alteration in the arrangement of the nervous matter, associated in not a few instances with hereditary peculiarity of the conformation of the nervous system, or of the constitution of the individual generally.[1]

CHAPTER II.

INFLAMMATION.

It must be admitted that there are difficulties in the way of presenting a clear, succinct, and, at the same time, sufficiently comprehensive definition of that pathological state of the system to which the term inflammation is rightly appropriated. The difficulty arises chiefly from two circumstances; first, our ignorance of the intimate nature of an affection which (like fever,) consists not in one, but in a series of changes in the vital actions of the capillaries; and second, the close relation which subsists between some of its forms or modifications, and those congestions which are accompanied by an increased activity of the vessels—a simple exaltation of their vital action.

[1] As congestive diseases, and the less active and acute forms of inflammation, (the subacute and chronic,) are, in several respects, very closely allied to each other, and as a modification of the antiphlogistic treatment is usually required for both, I have, in order to avoid unnecessary repetitions, deferred entering on the consideration of this topic at present—leaving it for the sequel of next chapter. I here, of course, allude to the active congestions; those of the asthenic and passive kind must be treated on principles altogether different—depletory and sedative or depressing measures of every description, producing an aggravation of their symptoms; tonics, and even stimulants, on the other hand, when cautiously administered, affording a permanent relief.

It has been stated, in the preceding pages, that local determinations of blood, and simple increased action of the vessels, may recur again and again without being productive of any consequence beyond a temporary embarrassment of the functions of the part; but that, wherever this happens, a transition from the state of capillary congestion, to that of actual inflammation, is very apt to occur; and particularly so if the part has been previously the seat of disease, or a general deficiency of vital power is manifested by the individual. Now, when, besides an augmentation in the vital contractions, succeeded by a gradual and increasing state of capillary congestion, a change takes place—not simply in degree, but in the *mode* or *manner* in which the vital actions are carried on at the extremities of the capillary system, whereby the secretions of the part are first diminished or suspended, afterwards increased, and ultimately displaced by certain substances (serum, albumen, fibrine, and pus,) which are separated from the blood contained in the extreme arteries and veins in a state approaching to stagnation —(and in which case it is probable that the blood has, along with the vessels themselves, undergone an alteration in its vital, as well as its chemical properties and affinities,)—when this series of phenomena then is perceived, the case may be considered one of actual and positive inflammation.

Symptoms.—To these pathological phenomena, however, are added certain others which are usually considered to be characteristic of inflammation; but which also occasionally accompany active congestions, and are therefore only indications of what may be termed the incipient stage of inflammation. These are—local increased Heat, Redness, Pain, and Swelling. They are styled the local signs or symptoms of inflammation, and are probably present to some extent in every case of the disease, whether situated in internal and deep-seated, or external and superficial parts of the body; and it is the *concourse* of these four symptoms that points out a case of disease to be one of inflammation according to nosological systems and definitions. But no correct opinion can be formed in regard to the extent, or even the existence of a case of inflammation, situated in parts which are beyond the sphere of tact and vision, from the four local symptoms solely. To guard, therefore, against fallacy in the diagnosis of internal inflammations, it is necessary to take into view another set of symptoms which usually accompany inflammation of an important part; I mean the symptoms arising from the sympathetic disturbance of the general system:—but, before entering on this, I shall briefly explain the *nature* of the four local symptoms, and notice certain other particulars relating to them, which, if not explained, might lead, in some instances, to a false diagnosis.

Heat.—This symptom would appear to be owing to the increased velocity of the circulation, and quantity of blood passing through an inflamed part. But as the velocity of the circulation, in the smaller vessels at least, is soon diminished, and is succeeded by

congestion, retardation, and ultimately, in the progress of violent inflammation, by stagnation of the fluid in the capillaries; and as the heat, under such circumstances, is still occasionally found to be a symptom, or, at all events, a matter of complaint with the patient; it follows that we cannot refer the sensation of increased heat entirely to an increase of the vital contractions of the vessel. It is very probable that this symptom may be, in part, owing to an increase of the vital actions of the nerves themselves, to whose agency is usually ascribed, in some measure, the generation of animal heat under ordinary states of the system.

An actual rise of temperature, as indicated by the thermometer, is probably manifested in the course of all inflammations. The extent, however, of the rise, is, in many cases, inconsiderable, and seldom exceeds on any occasion a few degrees; and appears to bear no fixed proportion to the intensity of the inflammatory action. But in inflammation of internal and deep-seated organs, any local development of heat will seldom (unless probably in inflammation of the membranes investing the different viscera, or lining the cavities,) be rendered obvious to the practitioner, neither will it be in general complained of by the patient, although even were it otherwise, his feelings must not be taken as any criterion of the *degree* of increased temperature.[1] Heat, as a symptom of inflammation, is probably most complained of, and most developed, in inflammation of the skin (erythema and erysipelas,) and fibrous structures (gout and rheumatism.)

Redness.—This is owing to the injection of the extreme vessels with red blood which formerly carried only a colourless fluid, and to an increased quantity of blood in every order of vessels of an inflamed part; while, at a later period of the disease, the redness is still further increased by the occasional extravasation of a portion of blood into the surrounding textures. The redness arising from inflammation is most intense in those structures which are naturally most vascular, *e. g.* mucous membrane, skin, glandular, and parenchymatous organs. But although increased vascularity and redness of the tissues are probably always present in inflammation,

[1] Distressing topical sensations of heat are sometimes complained of by patients who exhibit none of the other evidences or signs of genuine inflammation, but who appear to be labouring under affections of the nervous system, of the nature of hysteria, neuralgia, or hypochondriasis; affections which, though not inflammatory, are nevertheless frequently associated with local determinations of blood, and congestions, and with which therefore the sensation of increased heat may have some connection. The difference between heat as a symptom of inflammation, and as an effect simply of a modified action of the nerves (probably from local determinations of blood and temporary acceleration of the circulation of the part,) is this, that in the latter instance it is not steady and enduring, as in the former; and is more intense, more complained of, and more in proportion than other symptoms—such as pain, which may be also present without the case being one of inflammation.

they cannot of course be available for the diagnosis of inflammation of internal parts.

The redness is of the vermilion hue, in the early and active stage of acute inflammations, but assumes more or less of the modena or venous shade in the later stages; and in inflammation proceeding to gangrene the shade becomes still darker—the part which falls into this state ultimately exhibiting a black or greenish black colour. But in chronic inflammations, and in those which occur during states of great depression of the vis vitæ (for example, the inflammations which arise in the scrofulous constitution—in the course of idiopathic fevers—from the action of poisons and other specific causes,) the redness exhibits from an early period much more of the venous than of the arterial hue.[1]

Swelling.—This symptom is, in the first instance, to be ascribed to the distended and injected state of the capillaries; and, in the second place, to the extravasation of blood, serum, lymph, &c. into the circumjacent tissues. The swelling from inflammation is most observable where the cellular tissue and compound organs, into which cellular tissue enters largely as a component part, are the seat of the disease, and also in those organs and structures which are possessed of numerous blood-vessels—the mucous membranes, lungs, liver, and other glandular bodies. It is least observable, on the other hand, in dense and unyielding parts—serous, fibrous, and bony textures. This symptom also, like the two preceding, may appear independently of inflammation; for it may be owing to hypostatic congestion of the vessels, or to the simple transudations of blood or serum.

Pain.—This symptom would appear to be owing to the unusual pressure which is exerted on the nervous filaments by the distended capillaries in situations unfavourable to their expansion, or to the escape of a portion of their contents—and also to an exaltation of the vital actions of the nerves.

Pain, or at least an increase of the sensibility of a part, amounting to a feeling of *tenderness* when moderate pressure is applied, is the most important of the local symptoms of inflammation; and, indeed, when the disease is situated in an internal organ, it is the only one of the four local symptoms which can aid our diagnosis. A *fixed* and *enduring* sensation of pain, or of tenderness, when found in conjunction with other symptoms which still remain to be noticed, is a very sure indication of the existence of inflammation.

But this, like all the other local signs of inflammation, may mislead if too much relied on; for, in many important inflammations (of the lungs and mucous membranes, for example,) it is very little

[1] In all these cases the redness is so similar to what is seen in purely congestive affections, that from this symptom and appearance alone nothing conclusive can be drawn; and, in the absence of effused lymph, pus, and serum, the discovery of this state of a part in the dead body would be quite insufficient to establish the fact of a previous inflammation—*Vide* p. 22, *et seq.*

felt, while it is frequently a most prominent symptom in certain affections of the nervous system of a non-inflammatory nature.

The affections to which I allude are what may not inappropriately be styled acute hysterical neuralgias—constituting a variety of spasmodic disease when accompanied with irregular muscular contractions, as may happen according to the seat of the affection. They are usually traced to some temporary source of irritation, physical or mental,—often a combination of the two. In some instances the affection is confined to a single nerve, but in the cases which I have more particularly in view, a number of the filaments ramifying through a simple membranous texture, or through the tissues of a compound organ, (the peritoneum, pleura, lungs, stomach, intestines, uterus, heart, or kidney,) would appear to be the seat of the most painful nervous irritation. It is more frequently met with in some regions of the body than in others; but it is when situated in the abdominal region, or in the head, simulating acute inflammation of the serous membranes of the one cavity or the other, that we are most likely to confound it with inflammation.[1]

Although the limits of a work of this kind do not permit of much detail, I cannot avoid briefly stating the principal circumstances connected with these hysterical irritations, and one or two other particulars which may assist the student in his diagnosis of these difficult and embarrassing cases of disease.

1st then, The patient—most frequently a female, of mobile or nervous temperament, and probably subject to irregularities in the uterine or gastro-intestinal functions—is *suddenly* seized with a severe local pain, having exhibited none of the *premonitory* symptoms (languor, lassitude, chilliness, loss of spirits and appetite,) which almost always precede the invasion of acute and dangerous inflammations. 2d, The pain which forms the most urgent and prominent symptom throughout, instead of *gradually* increasing in severity—as is for the most part the case when proceeding from real and uncomplicated inflammation—is as much complained of from the very first outset as at any future period of the disease. 3d, The left hypochondrium is very often the seat of the first attack; but in this as in all the other particulars connected with these nervous and hysterical complaints there is much variety; and, indeed, in whatever region it may be seated, it is exceedingly liable to make a *metastasis* from one part to another of the same region or cavity, and sometimes from one cavity to another;—and this very disposition to shift affords another characteristic or diagnostic feature of the affection in question, as well as of the class

[1] The irritable breast and irritable testicle described in surgical works, furnish striking examples of local irritations, (distinct from inflammation,) and so do some cases of "nervous headache" (Cephalalgia); but the more chronic and circumscribed forms of this affection are not so apt to be mistaken for inflammation as those of a more active and transitory nature, occurring as just stated in the great cavities.

generally to which it belongs. 4th, The pain is generally observed to recur in distinct paroxysms, with marked intermissions. But here, to prevent misconception, it will be necessary to remark that the pain of inflammation is not, on the other hand, strictly continuous; the fact being that the pain even of inflammation always *remits* a little from time to time. Remissions and paroxismal increase of the pain of inflammation are most observable where muscular parts are involved directly, or by contiguity—for example, in inflammation of the coats of the stomach or intestines, the bladder, &c.—and also during the night, when the irritability of the nervous system of the patient is probably greatest, and the pyrexia at its height. I may here observe also, that when the pain of inflammation subsides, notwithstanding the disease, in other respects, is little abated (and this is often the case after the first stage,) a sense of tenderness will still continue to be elicited by pressure. It has been asserted, indeed, by some writers, that in all instances where the pain does not originate in inflammation, the pressure, by being *very gradually* applied, does not aggravate the pain, and that by repeating the pressure several times in immediate succession, it will be better borne each time; and, indeed, will generally cease to excite tenderness or other feeling of uneasiness—nay, on the contrary, will afford relief. This, however, is a circumstance and mode of procedure upon which it would not be prudent to place much reliance. But *lastly*, The danger of a false diagnosis in such cases may, it is presumed, in most instances, be avoided by attention to *all* the particulars just adverted to, and those which (bearing on the diagnosis of inflammation,) still remain to be noticed—namely, the symptoms of fever, the appearance of the blood, and the endurance of the system under large and repeated blood-lettings, when labouring under high degrees of inflammation, compared with the small degree of tolerance in this respect, in other circumstances, and especially in affections of the nervous system of the nature above described. Nevertheless there is one thing connected with the affections of which I have been speaking, which must never escape the recollection of the student—that, as they who exhibit them most frequently are, from the peculiarity of their constitution, exceedingly prone to local determinations and congestions of blood, so that which at first is purely a neuralgic affection may at length be *complicated* with inflammation; and, indeed, there is reason to suspect that in many of these cases some degree of local determination of blood or increased action of the vessels is present at an early period, if not from the first. Wherefore, in all cases where the pain is decidedly increased on pressure, and heat of skin, with other symptoms of pyrexia, is perceived—even though these should be only partially developed, and the pulse be small and compressible, conveying the idea of debility—we ought to suspect the presence of increased *vascular* action, and possibly of inflammation; in which case, accordingly, the most judicious treatment will consist of a combination of antiphlogistic measures with those which are

specially sedative;—for example, full and repeated leeching with fomentations, after one moderate general bloodletting; followed by a large opiate draught so soon as the bowels have been acted on by a dose of castor oil, or other mild laxative. But, indeed, in every case of inflammation occurring in persons of nervous and irritable constitution, free *local* bleeding will be preferable to much general depletion; and where the latter practice has been required, an opiate ought probably always to be administered immediately afterwards, in order to prevent any increase of the nervous excitement.

In conclusion, inflammation affecting different structures is attended with very different modifications and degrees of pain, the one bearing no fixed ratio to the other:—thus, in inflammation of the denser textures of the body (serous and fibrous membranes, skin, bone, &c.) the severity of the latter is generally in proportion to the intensity of the former; but again, in inflammation of the looser structures (mucous membrane, brain, lungs, kidney, liver,) no such relation is preserved; and indeed acute inflammations of mucous membrane, and of parenchymatous organs (parts largely supplied with bloodvessels and nerves,) are attended with comparatively little pain—not unfrequently with a sense of weight and oppression only; and in inflammation of the mucous membrane, firm pressure may, even at times, fail to elicit either pain or uneasiness. Nevertheless, the feeling of *soreness* or *tenderness* which I have mentioned as peculiarly characteristic of the disease, will, in by far the greater number of cases, be felt to some extent; unless, occasionally, where the brain is affected, and where the inflammation occurs in aged persons, or during the more advanced stage of continued fever, when the ordinary sensibilities are generally greatly impaired.

There are, however, regions over which pressure cannot be applied so as to reach the inflamed organ (the contents of the head and chest,) and these are the very parts in which acute inflammation may exist without giving rise to pain. The information, however, which may be derived from *auscultation* and *percussion* will, as far as regards the thoracic organs, afford valuable diagnostic signs, not only of the presence of inflammation within the cavity, but of the precise seat and magnitude of the affection.

From the observations which have just been made, then, on the *four local* symptoms, it will be apparent to the student that cases of internal inflammation may arise, in which, were he to trust solely to them, he would be involved in much doubt and perplexity as to the real nature of the case. Other particulars, therefore, demand his attention in forming a diagnosis: and of these the first is —EMBARRASSMENT AND DISORDER OF THE FUNCTIONS OF THE INFLAMED ORGAN: this I believe to be a certain consequence of all inflammations of the more active kind, occupying important parts. The functional disturbance generally keeps pace with the progress of the disease, extending to the neighbouring organs, and others

with which the inflamed one is either directly associated in office, or with which it on other accounts maintains a connection;—dyspnœa, cough, and other embarrassment of the respiratory function will, for example, speedily be produced by an inflammation of the lungs or pleura;—and again, inflammation of the brain, or its membranes, will be followed by disorder of the mental faculties, by loss of sensation and motion, and by nausea and vomiting, and other sympathetic disturbance of the stomach;—while, on the other hand, inflammation of this viscus will not only give rise to much disturbance of its own functions, and of those of the liver and other organs with which it is more immediately connected, but will impress, in a remarkable manner, the whole circle of vital actions, producing a powerful sedative effect on the heart and arteries. The second order of sympathetic affections that arise in the course of inflammation of important organs—and which, besides assisting in the diagnosis, furnish special indications in the treatment—are those usually comprehended under the title of GENERAL or CONSTITUTIONAL SYMPTOMS of inflammation, but otherwise styled PYREXIA or SYMPTOMATIC FEVER; and which, speaking generally, may be said to consist in an universal disturbance of the functions of the body—*i. e.* of the whole actions dependent on the nervous and vascular systems—and consequently of secretion, nutrition, and excretion, and all the other functions which are either subordinate or subservient to these fundamental operations of life.

The fever of inflammation is most usually characterised by the following symptoms;—rigor—chilliness—general depression of the vital actions—sense of muscular debility and fatigue from slight exertions—small, feeble, and irregular pulse—general languor, weight and oppression—aching and feeling of general uneasiness, especially in the limbs and about the præcordia. All which symptoms go to constitute the *cold* stage of fever, and to which gradually succeeds the *hot* stage or that of *reaction*, when we find the most prominent symptoms to be—increase of the general uneasiness and soreness—headache—pain of back and limbs—increased frequency and force of the circulation—the pulse being fuller, less compressible or harder[1]—and generally also (though by no means always,) quicker than natural—increase of the temperature of the body; and lastly, disorder and suppression of the secretions—the

[1] Although a hard or incompressible pulse (*i. e.* one in which the current of blood through the artery felt at the wrist is not so easily retarded by compression with the point of the finger, as in natural states of the system,) is what we usually meet with in *primary* and *uncomplicated* inflammation, still there are occasional departures from this general rule. In inflammation of the mucous membranes, for example, the pulse is generally as compressible as in health; and again, in inflammation of the serous coat of the intestines, it is extremely small and wiry. In many of the inflammations also of parenchymatous organs—*e. g.* the brain, lungs, and liver—the pulse, though commonly fuller and somewhat harder, may not be more frequent than natural: this is perhaps more particularly true in respect to inflammation of the first-mentioned organ.

tongue being white and furred—the stomach irritable—the skin hot and dry—the urine scanty and high coloured—and the bowels constipated; unless the inflammation be situated in the inner coat of these organs, when generally there will be diarrhœa. These symptoms usually continue with slight variations so long as the inflammation continues; the abatement of the latter being accompanied with the decline of the former, though not always at precisely the same period. On which occasion the pulse, if it has been frequent and hard, becomes slower and softer, the skin cooler, softer, and more perspirable, the tongue cleaner, and if dry and contracted, moist and spongy, the urine more abundant, paler, and as it cools, depositing a reddish sediment;—and with the progress of convalescence, the natural appetite for food and desire for sleep return. Such is the series of symptoms characteristic of the fever, or pyrexia, attendant upon cases of *primary* and *active* inflammation of important organs; and which has therefore been denominated the *inflammatory* type or form of fever.

But it occasionally happens that the concomitant fever of inflammation is more of a low nervous or *typhoid* type; in which case the general excitement of the heart and arteries is imperfectly developed, *i. e.* the reaction which succeeds the cold stage is less powerful and less enduring, than that which characterises the corresponding stage of the more ordinary type of the fever, and the derangement of the nervous system is both greater throughout and manifested from an earlier period. There is a greater muscular debility and general depression from the first—a greater disorder of the secretions—a more dejected and anxious aspect of the countenance—a feebler, undulatory, and more compressible pulse; and, in particular, there is an earlier tendency to delirium, marked by much confusion, wandering of thought and low muttering, subsultus and tremor; and finally, in the later stages, a greater collapse or exhaustion of the vital powers, and a greater disposition to stupor or coma. The deviations from the inflammatory type of fever to which we have just been adverting, may be of various degrees. 1st, The symptomatic fever may resemble an idiopathic synochus. 2d, It may be characterised by much excitement of the nervous system—marked by early and continued delirium, subsultus, tremor, constant pervigilium, &c., without a corresponding degree of excitement of the vascular, *i. e.* it may be of the variety termed "ataxic fever." 3d, It may be signalised by great *depression* of both the vascular and the nervous system; and by such a complete and universal prostration of the vital energies as to resemble that variety of idiopathic fever denominated adynamic.[1]

Much of this difference, in the type of the fever of inflammation,

[1] Surgical writers are in the habit of applying, to a particular form of the constitutional symptoms of inflammation, the epithets "irritative fever," and "fever of irritation"—being akin to what others have described under the name of "general or constitutional irritation"—and in many particulars resembling that which has just been alluded to.

may be ascribed to difference of constitution, and to the concurrent operation of other causes, besides the *common* or *ordinary* exciting causes of disease. The fever, therefore, is most likely to be a modification of typhus—1st, When individuals who are advanced in life, and who manifest a state of general debility and nervous irritation, become the subjects of acute inflammation. 2d, When inflammation attacks persons in whom the nervous system has been inordinately excited, in consequence of the frequent repetition or continued operation of powerful mental or physical impressions.[1] 3d, When inflammation supervenes on an intense, sudden, and, for the time, overpowering impression, mental or physical; *e. g.* concussion, escape, with probable slight local injury only, from fire or other source of imminent danger, severe lacerations and compound fractures. 4th, When the inflammation is situated in a part or organ of the body, having extensive sympathies with other organs, apparently through the medium of the ganglionic system of nerves. Thus, we find that in inflammation of some of the abdominal viscera, particularly of the serous coat of the stomach and intestines, a very low or *adynamic* type of fever is produced; owing no doubt to the extensive sympathies maintained by these organs throughout the body, and the sedative impression which is produced (probably through the medium of the great sympathetic nerve) on all parts of the system, when these organs are the seat of an acute and *painful* disease. 5th, When inflammation arises from a *specific* cause, especially from the introduction of any of the animal poisons into the system; for example, where an inflammation is caused by the bite of the rattlesnake, or the cobra de capello—and also, in certain cases, where inflammation follows a dissection wound.

It will thus be perceived, that, in the case where the fever of inflammation is a modification of typhus, another cause inherent or accidental, is superadded to the *ordinary* exciting cause of the local inflammation by which the vital actions are depressed, and, in particular, a sedative impression made on the heart and arteries. And it will, therefore, follow, that the more robust, young, and plethoric the individual is (cæteris paribus,) the higher will be the degree of *vascular* excitement, and the more will the fever assume the true phlogistic or inflammatory type.

In all inflammations, attended with the typhoid type of fever, the danger of a fatal termination is much increased: 1st, because of the depressing nature of the febrile actions, and the tendency to secondary combinations of inflammation, particularly in the brain and gastro-intestinal mucous membrane; 2d, because of the greater disposition to *uncircumscribed* effusions of pus and serum, and to gangrene; and 3d, because of the inflammation itself being less

[1] The fever which is consequent on an attack of inflammation, under such circumstances, will, almost for a certainty, assume that modification of typhus commonly known by the name of "nervous or brain fever"—the ataxic fever of recent writers.

under the control of the most efficient of the antiphlogistic remedies, viz. blood-letting.

Although the constitutional symptoms usually succeed the local, nevertheless, in inflammation of important organs they not unfrequently arise simultaneously; and when the inflammation is connected with constitutional predisposition, (*e. g.* gout, rheumatism, and erysipelas,)[1] the febrile symptoms may be observed to precede the local. The occurrence of the fever always tends to increase the activity and vehemence of the local actions, and consequently of the local symptoms. The fever, however, is not always in proportion to the extent and severity of the inflammation, nor to the importance of the affected organ in the animal economy; for, as formerly observed, the age and temperament of the individual greatly influence the character of the fever. Thus, in young children and in delicate females, the fever often runs very high when the inflammation is but slight; and from the great susceptibility of their nervous system, delirium is also apt to appear when no cerebral inflammation or other dangerous affection is present. In the sanguineous and plethoric, the fever is generally intense; but it will be remembered that in such persons the local inflammation is commonly of the most active kind.[2]

Again, in the aged, and in persons who have been reduced to a state of *great* debility by previous disease, *e. g.* idiopathic fever, or other causes, the constitutional and local symptoms are frequently very partially developed, and this, too, while extensive and destructive inflammation is going forward:—Cases of this description have been styled *latent* inflammations. The fever will also vary in intensity according to the structures affected; thus, in inflammation of the mucous membranes and parenchymatous viscera, the fever is generally more moderate, and the pulse nearer the natural standard, than in inflammation of serous and fibrous membranes. Lastly, The general and local symptoms for the most part *gradually* disappear *together*, in proportion as the inflammation abates; but exceptions to this may be observed—particularly in those of irritable habit of body, and in very young children. In all cases, however, the continuance of a febrile action assuming a *remittent* type, after the subsidence of the pain and other local symptoms, should create a suspicion of the disease having lapsed into a *chronic* form, or produced suppuration.[3]

[1] We might here instance the other febrile eruptions (measles, scarlatina, &c.) as exhibiting constitutional symptoms, before the topical inflammations appear; but these are cases of disease of a totally different character from the above, in so far as they arise from a *contagion* which probably influences the *whole* system before a symptom of any kind is manifested.

[2] It may be observed, that individuals of this habit of body are not so liable to be attacked with inflammation as persons of an opposite constitution, in whom the powers of the circulation are feeble.

[3] There are many cases of inflammation which pursue a very chronic course, and which, from being unattended by pain or other marked local symptoms, are apt to be overlooked in practice, and confounded with other

Finally, as the inflammation proceeds, the local as well as the general symptoms undergo various modifications, particularly when effusions have taken place; but these and other particulars will be best explained in the second part of the course.

III. *State of the Blood in Inflammation.*—When, during an attack of inflammation which is sufficiently acute to give rise to pyrexia, blood is abstracted from a vein of considerable size, and received in a pretty full stream into rather a deep and narrow vessel, so that it is not cooled and coagulated too quickly, a remarkable separation takes place between the fibrin and colouring particles; in consequence of which the latter will occupy the lowest part of the crassamentum, while a layer of fibrin of variable thickness and tenacity, and of a buff colour, will cover the surface; and in the acute and active inflammations, of the denser textures in particular, the coagulum will, besides exhibiting a coating of very *thick* and *tenacious* fibrin, be observed to be small, firm, and contracted, presenting a concave depression in the centre. And such are the characters of what has been termed inflammatory blood, *i. e.* blood drawn during the existence of inflammation which has produced excitement of the heart and arteries, and the other symptoms of genuine *inflammatory* fever. But, according to the recent researches of GENDRIN and others, the blood of those labouring under inflammation not only contains a larger proportion of fibrin, but also a larger proportion of albumen in the serum, than is found in blood drawn during healthy and natural states of the system.

As the appearances now described are only seen in blood which has been taken from patients labouring under inflammations accompanied with pyrexia, it follows, that the blood which is abstracted at a very early period of the attack will often exhibit no buffy coat —a sufficient time not having been allowed for the proper development of the constitutional symptoms. The blood, however, which has been drawn at the very commencement of those varieties of inflammation (gouty and rheumatic) which are connected with constitutional predisposition, (and the former often with a plethoric state of the system,) will usually exhibit both a strong buffy coat and a contracted coagulum. But, indeed, the blood of all plethoric individuals—in whom the heart and arteries have for some time been acting with increased force and velocity, and whose blood contains an excess of fibrin—will very generally display a buffy coat in the absence of local inflammation; although in this case,

diseases. When, however, we find a patient labouring under increasing debility—constant languor and lassitude—general uneasiness and depression—suffering from irregular feverish attacks, and exhibiting a slow but progressive emaciation—it is highly probable that a chronic inflammatory action is going forward in the body; the seat of which, though not made manifest by any of the four local symptoms (which we lately discussed,) may, nevertheless, be discovered by carefully examining every region of the body, and inquiring into the *manner* in which the different organs are discharging their *functions*.

neither is the fibrin thick and tenacious, nor the crassamentum cupped. The blood drawn during the secondary inflammations, which arise in the course of idiopathic fevers, will also generally exhibit a buffy coat; but here again, the buff, as well as the general appearance of the clot, differs in several respects from that which we have already stated its appearance to be in *primary* and *ordinary* inflammations; for in these secondary inflammations the fibrinous layer is loose and gelatinous, while the clot itself is large and spongy, generally filling the vessel so completely, that the whole or the greater part of the serum is contained within its pores.

It is the *firmness* of the clot, therefore, and the *cupped* appearance of it, quite as much as the buff, that indicates the existence of a true *idiopathic* inflammation. But, in inflammation of the softer tissues—mucous membrane in particular—few or none of the characteristic appearances of inflammatory blood may be perceived; and this is no doubt, in a great measure, to be ascribed to the little pain, and comparatively trifling general disturbance, attending inflammation of these parts.

As a general fact, it may be stated that the contracted and sizy appearance of the blood will be most strongly exhibited—1st, in inflammation of serous and fibrous membranes, and their modifications; 2d, in inflammation of the parenchymatous or compound structures; and 3d, least so, in inflammation of mucous membranes.

The only other point which requires to be noticed, under the present head, is, that a cupped and buffed state of the blood, which might be mistaken for the pure effects of inflammation—and as an indication for the prosecution of antiphlogistic measures—is often induced (and maintained, if already present,) by the peculiar excitement and reaction of the system, which is so generally observed to follow *extensive* depletion by the lancet, as well as the loss of blood in other ways.—Now, although the coagulum in this case is generally very small and even contracted, the coating of fibrin has seldom the clear yellow colour and tenacity, which it will be found to possess in blood, drawn during the earlier stages of an acute inflammation; on the contrary, it is usually of a pale yellow or greenish tinge—thin—gelatinous—and somewhat radiated on the surface. I may here also observe, that in the inflammations formerly alluded to, as connected with constitutional predisposition (rheumatic inflammation in particular,) the blood exhibits a buffed and cupped appearance, from the first to the last of the complaint —notwithstanding repeated and copious abstractions of blood.

IV. The diagnosis of inflammation may be greatly assisted in all cases by attention to the fact, that individuals, while labouring under inflammation, possess a power of sustaining the loss of a much larger quantity of blood by venesection, before syncope is induced, than the same individual would be able to bear in health; or when labouring under a disease which is not at all inflammatory—or at least not an ordinary and primary inflammation—but

one which either owes its origin to a specific cause, or which has supervened in the course of contagious fevers, or arisen during those states of the system alluded to in page 9.

Now this difference, in regard to the susceptibility of patients suffering under *different* diseases, to become faint from the loss of very different quantities of blood, is in no description of cases more observable, than in those with which inflammation is most apt to be confounded, viz.: the various nervous, hysterical, dyspeptic, and hypochondriacal affections.—Thus, should a case of disease about which we are doubtful be of this latter description, syncope will, in all probability, follow the loss of six or eight ounces of blood, or even a smaller quantity; whereas, should it be a case of simple or common inflammation, a quantity, varying from twenty to forty ounces, may generally be taken, before any such effect is produced.

It would also appear, that the power of enduring the loss of blood, in cases of inflammation, is, in a remarkable manner, proportionate to the violence of the inflammation, and the consequent necessity for free depletion of the bloodvessels. But this relative degree of tolerance to the loss of blood is no doubt greatly regulated by the constitutional powers of the patient—the circumstances under which the inflammation has arisen—the stage of the disease at which the blood-letting is practised—and, above all, by the nature of the tissues chiefly inflamed. For example, in the plethoric and robust, and in inflammation of the serous membranes and parenchymatous organs, a large quantity of blood may generally be detracted (thirty to forty ounces, or even more,) before any decided impression is produced on the heart's action;—while, in inflammation of the mucous membranes, the loss of half the quantity will suffice to induce syncope. There is one exception, however, to this, which requires in particular to be noticed—namely, that in inflammation of the serous coat of the stomach or intestines, the patient will generally show signs of syncope very early—probably before eight or ten ounces have been obtained—especially if abstracted in the erect posture;—a circumstance which is no doubt owing, to that remarkable depression of the heart's action, to which I formerly alluded. (See page 26.)

In conclusion, it is from the *concurrence*—the mutual correspondence and relation of all the phenomena, local and general, which have now been described as the concomitants of inflammation, that a safe *diagnosis* can be constructed, and a correct *prognosis* formed, in regard to the extent of the disease, and the magnitude of the patient's danger.

PROGRESS, EFFECTS, AND TERMINATIONS OF INFLAMMATION.—Inflammation is a progressive action, and when fully established pursues a course which is, for the most part, continuous, giving rise to certain new products, and ultimately, to alterations in the organisation of the parts affected;—although there are many instances in which the inflammation, after running a short course,

will be found to end in *resolution*, *i. e.* in recovery without any permanent injury having accrued either to the structure or functions of the part which was the seat of disease.

But inflammation is not always a continuous and steadily progressive process: for 1st, it may suddenly leave one part of the body and attack another—an occurrence termed *metastasis;* or 2d, the inflammation, without entirely leaving the part which was first attacked, may only undergo a mitigation, while other parts become affected;—and such is very frequently the course pursued, by inflammations of the skin, fibrous, serous, and muscular tissues, *i. e.* gouty, rheumatic, and erysipelatous inflammations. 3d, Inflammation may assume the intermittent form—the inflammation suddenly abating, and as suddenly returning at more or less regular periods:—Of this kind are some cases of ophthalmia. In general, however, where the inflammation exhibits a marked deviation from the continued and ordinary course, it will be found that some special intercurrent cause (*e. g.* Malaria,) is influencing the general system; or that there is a particular condition of the nerves, such, for example, as exists in Sciatica.

But it is here necessary to remark, that even the most violent inflammation will exhibit remissions, though in general they are too slight, and of too short duration, to give a specific character to the affection; and it is of consequence for the student to bear in mind this general fact, otherwise he might be led to consider an inflammation on the decline, when there is merely a *temporary* abatement in the activity of the morbid actions. These partial remissions in the force of the inflammatory action, are most perceptible towards morning, and in those in whom the vascular actions, while easily urged to excess, are, at the same time, wanting in that vigour and energy, which is necessary for their perfect persistence; hence, young children, delicate females, those in the puerperal state, and persons who have been much exposed to debilitating causes of any kind—but especially to such as have induced an unnatural excitability of the nervous system—will be most likely to exhibit the greatest degree of remission, as well when labouring under inflammations as under fevers, and other acute affections.

Increased and altered secretions; effusions of serum, blood, lymph, and pus; softening and induration of the tissues; together with ulceration and mortification, may be said to constitute the principal local effects or consequences of inflammation, in its different stages and modifications. The inflammation is usually observed to abate as the effusions proceed. They do not, however, necessarily bring it to a termination, but may cause it only to put on a milder and more chronic character; and which is very apt to be the case, when suppuration or ulceration has resulted.

I. The inflammation may subside spontaneously, or be subdued by the timely application of remedies before any important consequences have resulted—any probably, beyond a moderate effusion

of serum or soft lymph which will generally be soon absorbed; leaving the functions and structures of the part uninjured; and in which case the inflammation is said to be resolved or to have ended in RESOLUTION. But death is sometimes produced within a very few hours after the invasion of the disease, and previously to any important change having been effected in the properties of the blood, and the secretions of the part.[1] In this case the only appearance presented in the body will be a minutely injected state of the extreme arteries and capillaries, together with probably a little bloody serum; appearances which may be considered as characterising inflammation in its first or *congestive* stage; and at which period the disease does not, unless in the intensity of the vascular actions, differ in any thing from what we perceive in active congestions. This corresponds to the stage of inflammatory *engorgement* or *engouement* of the French.

An effusion of the serous or watery part of the blood, appears to be the earliest and most constant of the effects of inflammation. Sometimes the fluid is perfectly colourless and limpid—as in inflammation of the brain and its membranes; more commonly, however, it is of a yellowish tinge, or reddened by the colouring matter of the globules, which have separated from the fibrin;[2] while, at a more advanced period of the disease, it often exhibits a turbid and milky appearance, owing to the admixture of soft lymph, albumen, or pus.

II. The next effect of a progressive inflammation consists in the separation and gradual exudation of the fibrin of the blood, mixed with serosity, (*i. e.* albumen and water,) forming a soft, semi-concrete substance, somewhat translucent, and of a grayish yellow colour; unless when reddened with the colouring matter of the blood, which we have said is sometimes also effused in considerable quantity. This is the substance usually known by the name of *coagulable lymph*;[3] the effusion of which marks the second or

[1] The occurrence of death, at so early a period, is chiefly observed when the brain or peritoneum (particularly the stomach and intestines,) are extensively affected; and when young children are the subjects of acute inflammation. In the latter instance, the death is chiefly owing to the rapid exhaustion of the vital powers, consequent on intense febrile action; and in the former instances, respectively, to the sudden depression of the heart's action, formerly noticed as the concomitant of gastro-enteritis; and to the extensive engorgement of the capillaries of the brain, producing an embarrassment of its functions, in all respects similar to that which effusions of blood or serum would produce, *i. e.* coma, or apoplexy.

[2] Pure blood is extravasated during some acute inflammations, particularly peripneumony and dysentery; owing probably to a rupture of some of the smaller vessels. This commonly occurs during the early stage of inflammation, when the increased action of the heart and vessels is greatest.

[3] This is the most characteristic of all the productions or effects of inflammations, and that which affords by far the most satisfactory proof of its presence.—The previous existence of an inflammatory action cannot be determined, with equal certainty, from any of its other effects; for serous and bloody effusions, softening, induration, hypertrophy, and atrophy of the

adhesive stage of inflammation—the disease by this time having usually reached its acme.

Should the inflammation now abate, the serous or watery part of the effusion will be absorbed, and the fibrin and albumen will be left, forming a tenacious concrete mass; which, in many cases, undergoes a process of organisation, so as to become, not only capable of discharging the ordinary functions of organic life, but even of taking on the inflammatory action itself—exhaling blood and serum, and secreting tubercular and melanotic matter.

Certain structures are peculiarly susceptible of the adhesive inflammation, in the same manner as certain other structures are peculiarly disposed to become the seat of ulceration or suppuration, when inflamed. Thus, lymph is both very early, and very abundantly produced, when the inflammation is situated in serous membrane, in cellular tissue, and in the looser textures of the body,—the lungs, for example; and the changes, therefore, in the state of the lymph, to which we have just referred, will be most observable in inflammation of the pleura and peritoneum, where it very generally forms a bond of adhesion between the opposite inflamed serous surfaces;[1]—also in the lungs, liver, and kidney, where, in its concrete state, it gives rise to red or gray *consolidation* of the textures.

The mucous membranes generally are very little disposed to the adhesive form of inflammation, but there are one or two parts of them in particular, which, when acutely inflamed, not unfrequently exhibit a membraniform coating of coagulable lymph: these are, the mucous membrane of the trachea in children (croup) and of the large intestines in adults (colonitis or dysentery.) The effusion of lymph is the result of a *moderate* degree of inflammation, which has arisen from *ordinary* causes, and in persons of tolerably vigorous constitution; and it will be found that in specific and secondary inflammations, (scrofulous, erysipelatous, puerperal, &c.) the effusion of serum predominates greatly over the fibrinous and albuminous exudations.

III. *Effusion of Pus, otherwise styled Suppuration.*—According to recent pathologists,[2] the suppurative process consists in the conversion of the lymph and globules of the blood, from which the colouring matter has separated, into an opaque fluid nearly of the colour and consistency of cream; a change which is understood to be effected partly within, and partly exterior to the inflamed vessels.

Suppuration may be the principal if not the only effect of the inflammation; more commonly, however, it is preceded by effusions

tissues, and even gangrene, may assuredly all occur independently of inflammation—and the same may probably be affirmed at times of suppuration.

[1] From this circumstance the layer of organised lymph has been styled "the membrane of adhesion," also "false, pseudo, or adventitious membrane." Lymph, however, even in its unorganised state, will cause agglutination of inflamed surfaces; although, in this case, the adhesion is not likely to be so firm and permanent, as it would be, were it organised.

[2] Laennec, Gendrin.

of serum and lymph, the inflammatory action being thereby limited in extent, and the purulent matter circumscribed—forming an abscess. It is chiefly in specific—*e. g.* gonorrhœa, purulent and Egyptian ophthalmia, and inflammation arising from the animal poisons—and in acute inflammations occurring in depressed states of the system, that suppuration is found to be a prominent and early effect of the morbid action; and here, also, from the absence of coagulable lymph, the inflammatory process is apt to spread extensively; but, indeed, suppuration takes place soonest and most readily in every case where the inflammation is violent, and has originated in a weak habit of body. It is probably most quickly induced in mucous membranes; and occurs in the other structures of the body, according to the following order of frequency:—1st, Cellular tissue; 2d, Skin; 3d, Inner coat of the veins; 4th, Parenchymatous structure—(lungs,[1] liver, &c.); 5th, Serous and synovial membranes; 6th, Brain and nervous tissue; 7th, Fibrous and cartilaginous structures.[2]

IV. Pus, like serum and lymph, may be deposited, and afterwards removed, without any destruction or other permanent injury to the textures. This will often be the case in the mucous membrane of the urinary and air passages, and also (though less frequently) in the serous and synovial membranes and parenchyma of organs. But, in other instances, particularly in the gastro-intestinal mucous membrane, skin, bone, and cartilage, the effusion of pus is apt to be accompanied with partial and irregular absorption of the *solids;* commencing in the substance or on the surface of the inflamed tissues, and proceeding with more or less rapidity, until a breach of surface is effected. The process to which we

[1] *Diffuse* suppuration of the lungs is frequent even as a consequence of ordinary inflammation, while abscess is exceedingly rare; and there is a marked difference in this respect, therefore, between inflammation of the lungs and other viscera which contain much cellular tissue. It is not improbable, however, that the suppuration in this case is chiefly owing to the softening and conversion of the lymph, which has been effused into the air cells, into a purulent fluid, from the action of the external air, introduced through the medium of respiration; it being well known that exposure of inflamed parts to the air tends to destroy the adhesive process, and to favour the suppurative.

[2] Pus is sometimes rapidly formed in the lungs, liver, articular and serous cavities, and cellular membrane, after severe compound fractures, injuries of the head, amputations, and other great surgical operations to which suppuration has succeeded; and also during the suppurative stage of uterine inflammation, after parturition. These purulent collections are understood to be the consequence of the absorption of pus, and very frequently also of inflammation and suppuration of the veins leading from the seat of the primary inflammation. The pus which is thus introduced into the circulation, and mixed with the blood, is afterwards determined towards one or other of the above-mentioned structures, (generally the most vascular,) where it is deposited sometimes without being preceded by any very evident signs of visceral inflammation; though, in other instances, these secondary deposits, or metastatic abscesses, are attended with much constitutional and local disturbance.

now refer, has been styled Ulcerative Absorption, or simply Ulceration.[1]

While this process of ulceration is going forward, lymph,[2] as well as pus, is effused over the broken surface, the former of which becoming organised, (*i. e.* penetrated with bloodvessels,) forms small red eminences which project from the base and circumference of the ulcer: they are termed *granulations*. This is the process whereby an ulcer is healed up; the completion of the process, which consists in the granulations acquiring a covering of skin, having been denominated *cicatrisation*.

Here, again, we find that certain structures are more prone than others to fall into ulceration, when attacked with inflammation: these are the skin, and the mucous membrane of the fauces and alimentary canal. But ulceration is by no means so frequent a consequence of healthy inflammation, (*i. e.* of inflammation occurring in healthy constitutions,) as of inflammation attacking those of a weak and scrofulous habit of body, or of specific and secondary forms of inflammation—*e. g.* the syphilitic, and the inflammation affecting the intestinal mucous membrane, during idiopathic fever, and during the later stages of chronic organic diseases—particularly tubercular phthisis.

Further, in cachectic states of the constitution, and in the varieties of inflammation just mentioned, ulceration having commenced, is much more liable to spread than when it occurs in sounder states of the system, and is the consequence of ordinary inflammation; and, in these cases also, the effusion of lymph is often very sparing, and the process of granulation consequently imperfect and irregular, or altogether stationary. According, therefore, as the ulcerated surface shows a disposition to heal or not, it is styled healthy or unhealthy ulceration; while the epithets *irritable*, *callous*, *fungous*, *phagedenic*, and *sloughing*, have been employed to indicate more specifically the character and appearance of the unhealthy ulceration. For example, a rapid and irregular absorption of the tissues, an acrid quality of pus, and little or no disposition to granulation, are the characteristics of the *irritable* ulcer, and in a still higher degree those of the *phagedenic*.

Although it is difficult, when inflammation is situated in internal parts, to determine the precise time at which the effusions take place —their quality and quantity—nevertheless, we are enabled, in most cases, to determine those points in a general way, so as to suffice

[1] In the harder textures of the body, (bone and cartilage,) ulceration may occasionally precede the formation of pus; but it is probable that in the progress of the former the latter is always produced.

[2] The effusion of lymph almost always *precedes* ulceration. When this is not the case, hemorrhage is the certain consequence; and we find this now and then exemplified in some cases of scrofulous ulceration of the lungs—of the mucous membrane of the intestines, and in syphilitic ulceration, where the absorption of the solids has been rapid, and not preceded by the exudation of adhesive lymph.

for practical purposes. Thus, an abatement of the febrile actions—a softer but more frequent pulse—a cooler skin—greater debility—and a subsidence of the local heat and pain;—with increasing embarrassment of the functions of the inflamed organ, may always be considered as very certain proofs of effusion having taken place, *without* solution of the inflammatory action: and should the lungs, heart, or pleura, be the seat of the affection, (besides these general indications,) various alterations in the respiratory sounds, and in the sonoriety of the thoracic parietes, will be discovered when auscultation and percussion are resorted to. While, again, the *purulent* effusions, (*e. g.* into the lungs, brain, liver, or serous cavities,) will be more particularly indicated by rigors, followed by irregular hot fits. And to this will succeed a more or less regular *hectic*, should the suppuration be extensive or continued—*i. e.* a fever of the remittent type, usually marked by one or two paroxysms during the twenty-four hours, ending in profuse sweating—the pulse being generally very soft and compressible, and above 100 during the intervals—the emaciation progressive, and in some cases rapid;—with a growing debility and tendency to diarrhœa.

The same remittent type of fever will accompany the progress of ulceration in the intestinal mucous membrane, lungs, &c.[1] But the occurrence of suppuration in the mucous membranes (where the pus is commonly blended with vitiated mucous secretions) is neither in general marked by rigor, nor attended with the same degree of constitutional disturbance which we find it giving rise to in other situations—*e. g.* the shut cavities and parenchymatous viscera; probably because there is here no *sudden* deposition of pus, but a gradual transition of the mucous secretions into the purulent matter, which, instead of being retained within the inflamed tissues, finds a ready exit.

V. *Softening*, or loss of cohesion, is most commonly the consequence of acute inflammation. It takes place subsequently to the effusions of serum, lymph, or pus; and is in some measure, therefore, the result of the mechanical action of these fluids on the molecules and ultimate fibres of the inflamed part; but also of the altered state of the vital actions of the capillaries, and the consequent suspension of nutrition. The greatest degree of softening is observed in connection with diffuse suppuration, and serous infiltrations into the lungs, brain, subcutaneous, subserous, and submucous cellular membranes. The softened parts are usually of a gray or yellow colour when the effusion is purulent; while the softenings which occur at an earlier stage of the inflammation, in connection with serous and bloody effusions, present a deep red or brown

[1] It is chiefly in those of a feeble and irritable habit of body that the true hectic is seen as a consequence of suppuration. This fever assumes its most perfect character in tubercular phthisis; although even then, it is not always associated with either suppuration or ulceration, for it may be present during the early or *crude* stage of tubercular formations.

colour. Hence the former have been designated the *gray* and *yellow* softenings; and the latter the *red* softening. The yellow softening is most distinctly seen in the brain; and the red and gray in the lungs.[1]

VI. An increased aggregation of the tissues is principally observed in chronic inflammation, affecting the spongy texture of the lungs—the cellular membranes—the mucous membrane—(more particularly that of the colon)—the liver, brain, and kidney; and in which case the induration is probably always the consequence of a gradual effusion of lymph of very consistent quality. The indurated parts lose their transparency and lustre, as is readily perceived in serous, fibrous, and mucous structures; and they also present various shades of colour, owing to an occasional admixture of the red particles of the blood, as is best exemplified in the lungs and other loose textures, where the lymph produces the *red* and *gray* INDURATION, otherwise termed *hepatisation*.[2]

When the inflamed part loses its heat, its sensibility, and all the principles of life, mortification is said to have taken place. Mortification has been divided into two stages: gangrene, or the partial death of the part, being the first stage; and sphacelus or complete death of the part, the second stage.

But mortification is of two kinds—one the immediate consequence of inflammation, the other occurring without being preceded by inflammatory action. The latter has been termed *dry* or *chronic* gangrene, in contra-distinction to the *humid* or *acute* gangrene; and is that which results from ossification and obliteration

[1] *Non-inflammatory* softenings may originate in three conditions at least: 1st, from obliteration of the smaller arteries, and which may also lead to gangrene—this is chiefly met with in the brains of aged people; 2d, from the action of the gastric juice after death, in particular conditions of the system to be noticed at a future period—this, of course, will be confined to the stomach and upper portions of the alimentary canal; and 3d, from a peculiar cachectic state of the general system, resulting from defective nourishment or long-continued disease, which has ended in defective nutrition of the tissues—this, again, is chiefly seen in infants, and in adults labouring under tubercular, encephaloid, and carcinomatous affections, also scorbutus and purpura. The softening in this case pervades more or less all the structures of the body, and is attended with atrophy or wasting.

[2] Hardening may also arise, 1st, from *simple* excessive nutrition of a part —*i. e.* hypertrophy. this, however, when existing by itself, cannot be considered an effect of inflammation. 2d, It may be produced by an altered nutrition, unaccompanied with any other phenomena that can connect it with inflammatory action;—such, in many cases, is the origin of the calcareous depositions into the coats of the arteries in old age. While, 3d, in some cases induration is the effect merely of condensation from mechanical pressure of fluids, tumours, &c.—*e. g.* effusions into the cavity of the chest, compressing the lungs. The indurations arising from infiltration of tubercular matter into the lungs, and from carcinomatous deposit into the submucous cellular tissue, although in several respects different from the induration referred to in the text, as the consequence of *common* or ordinary inflammation, are nevertheless with difficulty distinguished from it in the early stage of their formation.

of the arteries, or other mechanical obstacles to the free circulation of the blood; also from eating diseased grain, such as spurred rye. In this case, the part gradually becomes cold, hard, dry, and of a black colour; there is no swelling, and very often no putrescency; and it is not preceded by increased redness, heat, or pain.

The occurrence of gangrene as an effect of inflammation is influenced—1st, by the structure of the parts affected; 2d, by the violence of the inflammation; and 3d, by its origin in specific and constitutional causes. It is more apt to occur in the skin, cellular substance, stomach and intestines, than in other textures; and in individuals who are under the influence of the animal poisons, virulent contagions, or other depressing agents. Habitual intemperance (especially in spirituous liquors,) and old age, also favour its occurrence; and parts in which the circulation has been much weakened (*e. g.* palsied, frost-bitten, and dropsical parts,) are more apt to run into gangrene, when attacked with inflammation, than parts whose circulation is vigorous.

When a part is about to pass into the state of gangrene, the patient not unfrequently complains of a burning heat in it, and an increased pain, while not unfrequently the sudden cessation of both indicates that this event has actually taken place.[1] The part affected assumes a dark red colour, and this proceeds, from a lighter to a darker shade, till the natural colour, heat, and feeling are entirely gone; and when the parts have passed into a state of sphacelus they lose their natural cohesion, glossiness, and transparency, in consequence of which they become soft, friable, humid, and putrescent. If the mortification be extensive, or situated in a vital organ, the fever usually becomes adynamic—the pulse very feeble—the skin cold and clammy—and features collapsed.

When a part has fallen into complete mortification, and the progress of the disease is stopped, a process succeeds, by which the dead are separated from the living parts. There appears upon the living part, at its junction with the dead, a red and indurated line, the consequence of adhesive inflammation, to which succeeds a slight crack or fissure, marking the commencement of the ulcerative absorption; and whereby is ultimately effected the *sloughing*, or complete separation of the sphacelated parts.

The Proximate Cause or Theory of Inflammation.—To investigate the merits of every explanation which has been attempted of the intimate nature of the inflammatory actions would hardly be consistent with the design of the present work, neither would the result of such an inquiry be at all instructive or satisfactory to the student, seeing that so many eminent physicians and experimentalists have differed widely in regard to the data on which the inquiry should proceed; and that many of the fundamental points involved

[1] A *sudden* cessation of pain is by no means always the precursor of gangrene; for gangrene may take place in a case where little pain has been complained of, and where the inflammation has been subacute.

in the inquiry are thus left to individual conjecture. I shall rather endeavour, therefore, simply to express what has appeared to me, on the credit of the most able observers, to be the condition of the vessels during the successive steps of the inflammatory process; and afterwards briefly enumerate one or two of the principal hypotheses which have been advanced in explanation of the several changes, which the capillary circulation undergoes in the progress of the disease.

It would appear, then, 1st, that the flow of blood through the vessels of the part forming the seat of inflammation is *accelerated*, and the secretions of the part suspended; and that the arteries immediately adjoining and leading to the seat of disease, are acting with greater force than in the healthy state. 2d. That this is followed by dilatation, over-distention and congestion of the vessels, and consequent *diminished* flow of blood through the part; a change which takes place in the ultimate branches first, but which gradually extends to the more distant and larger ramifications; and which is attended with *increased* and *altered* secretions, and effusions of the serous part of the blood. 3d. That as the disease advances, the blood becomes viscid, coagulates, and stagnates in the capillaries; and that a further separation of its ingredients takes place—the more solid matters (albumen and fibrin,) of which it is composed, being gradually exuded into the surrounding textures, together with new compounds, formed in consequence of an alteration in those vital and chemical attractions which are carried on at the extremities of the capillary system. The period at which the increased action of the vessels gives way to distention and diminished action, and the extent to which this may proceed, will depend greatly upon the intensity of the previous vascular excitement, general and local, and the strength or energy of the constitution; and it is with a reference to these points that inflammations are divided into active and passive, and into sthenic and asthenic:—although, according to the foregoing statement, inflammation can never be considered strictly as a *passive* disease, but only as displaying, in one case, a less energetic action of the vessels than in another, and a greater and earlier loss of tonic power, *i. e.* a passive *stage* disproportionate to the preceding active *stage*—as is the case, for example, in the catarrhal affections of old people, in strumous ophthalmia, and in the inflammations which arise during convalescence from fever, or which make their attack at a time when the powers of the system, from any cause whatever, are greatly reduced.

The precise nature of the change in the vital actions of the capillaries, upon which depends each link in the chain of morbid phenomena, just referred to, is a question which has engaged the attention of medical inquirers in every age. The following are the most extensively received theories in regard to it: 1st, that it consists simply in an *increase* of the vital contractility, or *tonicity*, of the extreme arteries. This is the doctrine which has been main-

tained by ancient as well as modern physicians of great eminence; but, although it accounts satisfactorily for several of the *early* phenomena of inflammation, it by no means affords a sufficient explanation of the whole process; and, indeed, amounts to nothing more than a definition of the state of *active congestion* or *local determination* of blood. 2d. It is asserted that the disease consists essentially in a *loss* of tonic power, leading to a state of *passive* dilatation and congestion of the extreme vessels. This hypothesis, again (the very opposite of the other,) has been and still is supported by men of equal eminence with those who have adopted the former views; it is, however, quite inadequate to explain the fact of a *larger* quantity of blood passing through an inflamed part in a given time, compared to the quantity transmitted by the same vessels during a state of health—supposing those vessels (as the hypothesis does,) to be acting with diminished energy from the *outset* of the disease—and, moreover, is directly at variance with the light which is thrown upon the nature of morbid actions by an attentive observation of the juvantia and lædentia—*i. e.* the immediate or exciting causes of the disease, and their mode of operation, and the nature of the remedies which are found to be most efficacious for its removal; which, in the present case, are agents of a nature calculated to depress rather than exalt the vascular actions, —such, at least, would appear to be the effect of the remedies which are found most efficacious for the cure of the disease in its *earlier* stages. But, 3d, the proximate cause has been ascribed to an *active* dilatation of the extreme vessels; of a description analogous to what takes place in the muscular fibres of the heart at the time of its diastole, or like to what occurs in the proper erectile tissues. This is what Kalkbrunner has styled the inflammatory erection of the capillaries; and it is a similar idea which Hunter appears to have entertained, when he makes use of the words active dilatation, in speaking of the intimate nature of inflammation.

In conclusion, it may be observed that whichever way the inquiry leads us, we are met by a difficulty which the present state of physiological science does not enable us to remove—I refer to the condition of the nerves. For, since the nervous system is undoubtedly concerned in *regulating*, if not essential to, the performance of that function of the capillaries, whereby the nutrient particles of the blood, in different proportions, combinations, and states of aggregation, are appropriated for the growth and nourishment of the various structures of the body, and which vital property is seen to be involved at a very early period in the train of morbid phenomena, it certainly would seem that no theory of the intimate nature of inflammatory action can be satisfactory, which does not embrace the consideration of this point. We know, however, too little as yet of the vital endowments of the nerves of organic life, and of the laws which govern them, to form any just conclusions in regard to the nature of the pathological changes which they undergo in this, as well as in fever, and many other

affections. If the co-operating agency of the nervous system in the production of the phenomena of inflammation be disputed—(and there are some who seem disposed to ascribe every movement in disease to a mere change in the vital *contractions* of the vessels)—it is only requisite to take a cursory view of the circumstances under which the two local symptoms of heat and pain are developed, in order to remove all doubt as to the fact of this agency, and to be convinced that the nerves are in a state of excitation: an increase of nervous action, by the way, which appears to afford a confirmation of the first part of our statement, viz. that there is, in every case of inflammation, an *increased* action or augmentation of the vital properties of the vessels, whatever other invisible intermediate circumstances there may be, in the part or system generally, antecedent to the increased impetus—a point of more practical importance for the student to bear in mind than any other, and which, although disputed by theorists, is nevertheless that which is most consistent with the whole phenomena of the disease, and, at the same time, safest as a principle of practice.

Remote Causes of Inflammation.—The most obvious of the *exciting* causes of inflammation are the different chemical and mechanical irritants, comprehending a great variety of agents, besides a few animal, vegetable, and mineral substances, whose action is specific, *i. e.* productive of a peculiar modification of the local and constitutional symptoms—exciting, in some instances, disorder of the general system, previously to the manifestation of any local inflammatory action.

Visceral inflammations, however, owe their origin comparatively seldom, to direct local irritants; cold, or cold combined with moisture, appears to be their principal exciting cause. In some instances, the action of this agent is strictly local, but, in many other instances, it induces inflammation in organs with which it could not have come in direct contact. It is probable that cold is productive of internal inflammations by suddenly or more gradually suppressing the capillary circulation on the surface of the body, thereby diverting the current of the blood to parts which are in a state of predisposition;—the morbific effect of the cold being at all times much increased by previous excessive stimulation of the cutaneous vessels, and profuse perspiration, especially when resulting from fatiguing exertions—such circumstances having diminished the power which the body has of resisting the depressing influence of this and other external agents. Inflammations, however, often arise from causes whose agency cannot be traced; and the cases of this description are styled Spontaneous Inflammations, in confession, I presume, of our ignorance of their causation; a predicament in which the physician is often placed in regard to the etiology of many other important affections which come under his cognisance in the course of practice.

The gradual and continued operation of agents calculated to produce permanent diminution of vital energy—for example, want

of invigorating exercise, long exposure to a cold and damp atmosphere, or to a hot and relaxing climate, watching, poor living, fatiguing mental and corporeal exertions, impure air, depressing passions, excessive evacuations—may be considered as the chief *predisposing* causes of inflammation. The presence of functional disorders and organic lesions favour the operation of the exciting causes; and a predisposition is also given to certain varieties of inflammation, by age, sex, climate, and those peculiarities of organisation which constitute the various temperaments and constitutional predispositions or diatheses—*e. g.* the gouty, scrofulous, and rheumatic. Thus, a person of scrofulous diathesis, or one who has suffered previously from catarrh or inflammation of the lungs, will be most likely to be attacked with pulmonary inflammation; while another who has become plethoric from full living, or who has a natural tendency to plethora, will be most liable to gouty inflammation; and a third, who is of the bilious temperament, and subject to an irregular and irritable condition of the gastric system, will be more prone than others to inflammation of the stomach, bowels, or liver, and also more subject to erysipelas and other exanthematic inflammations; while a fourth, who is of the sanguineous temperament, will be rather predisposed to acute phlegmonous inflammation, *i. e.* inflammation of the adhesive or circumscribed form. Again, infantile life will predispose to inflammation of the brain and mucous coat of the bowels; puberty—to inflammation of the lungs; old age—to chronic inflammation of the bladder, kidneys, and mucous membranes generally; a hot dry climate—to inflammation of the liver and skin; a cold climate—to inflammation of the lungs and air passages; excess in spirituous liquors—to chronic inflammation of the stomach and liver; and the puerperal state—to uterine and peritoneal inflammation.

The chronic form of inflammation arises from the same causes which produce acute inflammation, with this difference, that the exciting causes of the latter have been more intense, and have generally operated upon a more vigorous constitution; while a less intense, but longer continued and oftener repeated application of the same causes to a person of feeble constitution—natural or acquired—gradually induces that low, but more enduring (*i. e.* chronic) form of inflammatory action, whose tendency it is to cause effusion of a solid, grayish looking lymph, which is apt subsequently to assume a granular aspect, or, where there is more of the strumous diathesis present—a caseous or tubercular deposit; ending in either case in a permanent consolidation of the textures.

Division of inflammation into varieties.—After the many allusions, which have been made in the course of the present subject, to the manner in which the whole of the phenomena of inflammation are modified, by difference of structure, predisposition, and exciting cause, it seems now only necessary to state briefly, the varieties into which inflammation has been divided.

First, then, inflammations are primary or secondary, idiopathic

or symptomatic :—Thus, the inflammations of the brain, lungs, or intestines, which supervene in the course of common continued fever—measles—scarlatina, and small-pox, are either secondary or symptomatic ;[1] while the inflammations which are produced by exposure to cold, or which follow a wound or chemical irritant, are primary or idiopathic.

Second, inflammations, primary as well as secondary, are divided into the acute, subacute, and chronic—terms which are usually employed both with a reference to the *duration* and the *intensity* of the inflammatory actions. Inflammations are also sthenic and asthenic, or tonic and atonic, in reference to the constitutional powers of the patient.[2] Inflammations occurring in sthenic states of the system commonly pursue a rapid course; those of the asthenic kind are commonly less active—of this description are the inflammations which arise during the later stages of typhus fever.

Chronic inflammation is very often a sequence of acute inflammation, but it may also be the primary form of the disease, in which case it is usually associated with other diseased states of the body, and with much general debility, (asthenia.) Chronic inflammations often arise by imperceptible degrees, from previous congestions which had formed during states of general debility. They generally proceed in their course attended by few of the external signs, general or local, which mark the presence of the acute disease. (See note 3 p. 27.) When the affection is situated in internal parts—where the morbid changes, which were specified as being characteristic of the inflammatory process, are hid from our view—it is often extremely difficult to discriminate between such cases of inflammation, and the chronic organic changes, which depend on alterations in the function of nutrition, independent of any inflammatory action of the vessels.[3] But in the cases to which we

[1] Some eminent Pathologists dispute this statement, alleging that the visceral inflammations are primary, and essentially connected with the fever.

[2] Some employ the terms active and passive, to mark the intensity of the local actions, but they are objectionable, for reasons formerly assigned.—See page 39.

[3] *Scirrhus* is adduced by some as an example of the effects of chronic inflammation : if connected with inflammation at all, it is certainly a specific form of it. I may here observe also, that some not only consider true scirrhus or carcinoma as the effect of inflammation, but tubercle, and all other morbid growths, tumours, or adventitious structures whatever, as the result of inflammation. That the predisposition to such formations may gain strength, and latent morbid actions be roused into activity by the presence of inflammatory action, or, indeed, by any circumstance that quickens the circulation, and produces a temporary disturbance in the system, appears very certain ;—no doubt also the *growth* of adventitious structures is greatly promoted by the supervention of inflammation or congestion ; but that the *origo mali*—the pathological cause of such deposits—is not inflammation, appears equally certain. A peculiar constitutional taint, in some cases hereditary and in others acquired, would seem to be necessary to such formations; and the greater the constitutional taint, the less irritation local or general will be necessary to excite the vessels to the production of the

now refer, the establishment of a diagnosis would be of comparatively little consequence, since it would lead to no very important practical results.

The inflammations styled subacute usually occur in individuals of a strumous, and rather weak habit of body. The vascular actions are of a subdued kind, and the local and constitutional symptoms are by no means urgent, and the cases of this description are often nearly allied to active congestions. They run a course usually of some days, generally ending in pretty extensive serous effusions, mixed with flocculent lymph or pus; but the two latter are seldom in any quantity, and the lymph is soft and albuminous, on which account the serum is commonly white and turbid. This is the form which inflammation is apt to assume when it seizes on parts which have been weakened by previous acute inflammations. The inflammations also which arise in the course of fever—where contagion has exerted its depressing or sedative effect on the heart and arteries—are usually of the subacute variety. Between the modified cases of inflammation now specified, and the more acute and overt forms of the disease, there is assuredly a very obvious difference, though it is presumed that the difference is only in degree, not in kind—the same pathology being applicable to both, so far at least as relates to the inflammatory actions themselves.

I must here again remind the student that these divisions and distinctions of inflammation into the acute, subacute, and chronic, are often blended with each other, and in practice not always strictly defined; and that what was at first chronic, may, in progress become acute or subacute—a circumstance indeed so common as to demand the utmost watchfulness on the part of the practitioner to guard against the danger attendant upon it. The distinctions of inflammation now given are of much practical importance, but inflammations may further be distinguished according to their exciting and predisposing causes—whether these be constitutional or extrinsic—common or specific—whether of a nature powerfully to depress the vital actions of the system, and to contaminate and alter the properties of the blood. Thus, when inflammation arises in consequence of exposure to cold, or to any of the other ordinary exciting causes of disease, and when at the same time it is not connected with, or in any decided manner influenced in its course by, a diathesis, or morbid constitutional predisposition, hereditary or acquired, it is then said to be a *common* or *simple idiopathic* inflammation. In this case the symptoms, local and general, are usually of moderate intensity, ending for the most part in effusion of plastic or organisable lymph, any effusion of serum or pus which may take place, being generally in moderate quan-

one or other of these adventitious substances; and assuredly in some instances where tubercle or carcinoma (whether of the soft or hard variety) is met with, we are altogether without proof of inflammatory action having been present at the time of their formation.

tity, and bounded by lymph ;—effusions of serum or scro-purulent fluid, mixed with a little albuminous exudation, being on the other hand amongst the characteristic effects of those inflammations which originate in specific exciting causes, or in depressed and peculiar states of the constitution, and which are therefore styled *specific* inflammations. The first of these *i. e.* the common idiopathic inflammations, may be also in a general way styled *phlegmonous* inflammations, and the latter *erysipelatous* inflammations also *adhesive* or *circumscribed* inflammations, and *diffuse* or *spreading* inflammations. The disposition to spread is chiefly manifested ; 1st, In inflammation of the skin in irritable and debilitated subjects ; 2d, In the mucous membrane of the fauces and œsophagus in ill-nourished children, and in others labouring under debilitating chronic diseases ; 3d, In the mucous membrane of the colon, in some cases of dysentery connected with malaria, contagion, or states of great mental and corporeal depression ; and lastly, it is met with in some cases of inflammation of serous membrane, especially the epidemic form of puerperal peritonitis—by some termed puerperal fever. In the latter instance the effusions are serous or sero-purulent, containing little or no lymph, while the mucous membranes so affected exhibit an albuminous or aphthous appearance ; the febrile symptoms being, in such cases, always more or less typhoid. The usual antiphlogistic measures, especially *general* blood-letting, are comparatively ineffectual in checking the progress of this form of inflammation, and altogether inadmissible after the first stage.

There are several other varieties of inflammation which may be considered as specific, each being connected with a peculiarity of constitution or a peculiar exciting cause, and each affecting a particular set of tissues in preference to others :—These are, in particular, the rheumatic, the gouty, the scrofulous, and such as are induced by the syphilitic and other animal poisons ; besides those arising from certain vegetable and mineral substances—mercury in particular. When inflammation attacks the scrofulous constitution, it is most apt to assume the subacute or chronic character, tending especially towards the production of a caseous, or, what is otherwise termed tubercular matter. Finally, there are varieties of inflammation according to differences in the texture of the part affected ; these, however, will be already sufficiently understood from all that has gone before, and need not therefore be enlarged upon.

Treatment of Inflammation.—In forming rules for the treatment of inflammation, it is necessary to attend to the following circumstances in their mutual relations.—1st. To consider attentively the general state of health, and the degree of constitutional energy possessed by the individual patient ; and in regard to this, our judgment must not be formed entirely from the feelings expressed by the patient, since languor, lassitude, and a sense of muscular debility are prominent features of complaint in the com-

mencement of all acute diseases, where *real* debility does not exist, but where the functions, more especially of the nervous system, are in a state merely of temporary depression. We will thus be led to determine whether the inflammation be sthenic or asthenic, and whether the constitutional symptoms be of the nature of synocha or typhus. 2dly. To consider the intensity and duration of the local inflammation—particularly whether it be in its first stage, or whether it has already proceeded to effusions, or permanent change of structure. 3dly. To consider whether it has originated in a common or specific exciting cause, or is connected with a peculiarity of constitution, or such condition of the system as would materially modify the local as well as the constitutional symptoms. 4thly. To consider the precise seat and extent of the inflammation —whether, for example, it be confined to the pleura—to the mucous membrane of the bronchi; or to the parenchyma of the lungs. And, lastly, to consider whether, and in what manner, it may be complicated with other diseased actions, with organic lesions, or any other kind of general or local disease whatever; this is a point of great importance, and upon the knowledge of it much of the success of our treatment depends.—This applies of course to the class of secondary inflammations, but which, it must be also remembered, are of frequent occurrence, more dangerous to the patient, and in general more difficult to treat than primary inflammations.

Bearing these several circumstances in mind, the following are the principal curative indications. 1st. To subdue the increased force of the heart and arteries—to lessen the *vis a tergo*. 2d. To diminish the local excitement and congestions, and to alter the actions of the inflamed capillaries. 3d. To alleviate the local pain, and the morbid sensibility of the nervous system generally; which when excessive is apt to occasion death, by producing a rapid exhaustion of the heart's action,—as happens not unfrequently in abdominal inflammations, particularly in those which supervene on parturition affecting the serous membrane of the intestines, and in all the acute inflammations of young children, delicate females, aged and debilitated persons.

The means chiefly to be relied on, for the fulfilment of these indications, are:—blood-letting, general and local; abstinence from animal food and stimuli of every kind; quiescence of mind and body; the topical application of cold, hot fomentations, and pediluvia; counter-irritation with blisters and tartrate of antimony; the internal use of tartrate of antimony, mercury, opium, digitalis, and colchicum. Some of these remedies are more suitable for one stage, and for one variety of inflammation, than another; and some of them are to be preferred to others, according to the particular organ and structure affected; while there are cases of inflammation in which even stimuli may be requisite at an early period of the disease.

Bleeding.—In practising blood-letting in inflammation, our object is to reduce the force of the heart's action, and to keep it in a

state of depression for a certain space of time, until the local inflammatory actions have subsided. If we can succeed in controlling the inflammatory fever for the space of some hours, we will seldom fail to give an effectual check to the local actions; and gain time for the action of other remedies which exercise their influence over the disease in a more gradual manner. One or two full bleedings, practised early, and at short intervals, will prove much more effectual for this purpose, than a number of smaller bleedings practised at more distant periods. Further, in order that the strength of the patient may be saved as much as possible, it will behove us, in all cases of magnitude, anxiously to watch the period when the heart and arteries begin to recover from the temporary depression into which they had been thrown by the first bleeding, and should there then be the slightest indication of a recurrence of the local pain, uneasiness, or embarrassment of function, blood-letting must be repeated, to such an extent as the strength of the patient and the importance of the case seem to warrant; but, indeed, in all acute and active inflammations, it very generally happens that only a very temporary effect is produced by the first bleeding. In a word, so long as the inflammatory symptoms continue unabated, with high fever and a hard pulse,[1] the bleeding must be repeated at short intervals, so that the force of the disease may be broken while yet in its first stage. We must, however, again remark that blood-letting, and all other depletory measures, are in each case to be carefully apportioned to the strength of the patient's constitution, the duration of the inflammation, and the exigencies of the case: for example, should there be extensive inflammation of *both* lungs, the most vigorous treatment must be adopted without a moment's delay, and pushed to the utmost limits of the patient's strength; provided we be satisfied that effusion has not yet taken place to any great extent. Some acute inflammations there are, however, especially of serous and parenchymatous structures, in which even at this late period a *moderate* bleeding will prove decidedly useful.[2]

[1] When a pulse, which has been hard, or sharp, and contracted, (as is generally the case in inflammation of serous and parenchymatous structures,) becomes softer and fuller after the abstraction of blood, we are furnished with a pretty decisive proof of the propriety and efficacy of the measure. And further, when the blood presents a firm, opaque, and concaved buffy coat—at the same time that there is a recurrence of pain and hardness of the pulse—a repetition of the blood-letting will be both safe and necessary. Should the coagulum, however, present a flat surface—be semi-transparent, of a yellowish green colour, and of a striated or filamentous appearance, it will seldom be either safe or beneficial to abstract more blood from the system; and then local bleeding must alone be practised, should any further depletion be thought requisite on account of a continuance or recurrence of any of the inflammatory symptoms.

[2] Although the pulse, under the circumstances above alluded to, may not be strong; nevertheless, if it be sharp and somewhat resisting, and if the heat of surface remain steadily above the natural standard, there is much probability that the abstraction of from six to ten ounces of blood will prove useful. When, however, the pulse is very compressible, as well as small in

Patients advanced in life, young children, and persons of the strumous diathesis, cannot sustain large or repeated blood-lettings; and in them, also, we ought to avoid inducing complete syncope. Moreover, in individuals of a nervous and hysterical temperament, the loss of much blood is apt to be followed by great irritability of the system—violent and irregular action of the heart—palpitations—sometimes delirium, and a long train of nervous ailments.

Topical Bleeding.—Although in the incipient stage of acute inflammation in a healthy constitution, no remedy is more powerful than bleeding, on the other hand, no practice is so replete with danger after the disease has existed for some time; and especially, if it be situated in a mucous membrane, (*e. g.* the bronchial,) from whose surface a copious secretion is going forward. But, indeed, general bleeding at no time exerts the same marked influence over inflammation of the mucous membranes, which it exercises over acute inflammation of other structures; and such being the fact, we very generally find that after one, or at most two moderate bleedings, the future course of this class of inflammations is more under the control of cupping and leeching than general depletion. It is only, however, be it remembered, after the intensity of the febrile actions—after the force and hardness of the pulse have been reduced, and not till then, that cupping or leeching prove powerful antiphlogistic auxiliaries. In all cases of acute inflammation occurring in aged, scrofulous, or phthisical subjects; and in those in whom the general health has been much impaired by habits of intemperance, night watching, great mental and bodily exertions, bad diet, and bad air—cases which often end quickly in abundant sero-purulent effusions, attended throughout with a low type of fever—in all such, free local bleeding will be the safest practice. Some of these cases will no doubt derive great benefit from a general bleeding, when practised at a *very early* period; but there are others of them in which the loss of even a very small quantity of blood by the lancet will not be sustained, and where, consequently, free local bleeding affords almost the only chance of preserving life. The cases to which I now allude are, more particularly, the inflammations of the pleura, lungs, and intestines, which supervene on the chronic catarrhal affections of old people—on the softening and suppuration of tubercles—and on the intestinal ulcerations which so often accompany the progress of this latter affection; to which may be added, the *latent* inflammations of the chest and abdomen, which arise in the course of various diseases,

volume, we may be equally certain that general bleeding, and indeed every kind of depletion, will only tend to aggravate the symptoms; such circumstances rendering it highly presumptive that effusions have already taken place to some extent, and which it is probable would only be increased by any further reduction of the vital powers, now that the inflamed capillaries are in a state of passive engorgement; while it is also to be remembered, that by sinking the patient's strength at this period, we put in hazard the only chance which is left to nature of effecting a recovery—I mean, by absorption of the effused fluids.

more especially in the advanced stage of fever. We repeat, that leeching or cupping, followed by blisters, must form the chief, if not the only, system of depletion in such cases; at the same time that opium, and sometimes even small quantities of stimuli, will be found essentially necessary, after the inflammatory excitement has yielded in some degree to the local bleedings, &c.[1]

General bleeding is most efficacious, then—1st, in *acute* inflammations, more especially when situated in the parenchyma of organs, and in serous membranes: whilst free local bleeding is more suitable to inflammation of mucous membrane. And 2d, venesection is most beneficial when employed early, and carried to such an extent as to make a decided impression on the force of the general circulation; wherefore, in all inflammations attended with febrile action, when called early, we should abstract blood in a *full* stream, allowing it to flow until the pain and functional embarrassments are relieved, or a tendency to syncope is induced—repeating it promptly as occasion requires.

Cathartics.—The substances of this class are next to blood-letting, in point of efficiency, in the cure of the more acute forms of inflammation. Their therapeutic action is twofold; they cause a copious discharge of the watery part of the blood, and consequently tend directly to deplete the vascular system; and secondly, they cause a determination towards the mucous coat of the intestines, and in this way divert the current of the circulating fluids from the inflamed organ, relieving it from a state of congestion. During the time of their operation, also, a direct sedative effect is produced on the heart's action.

Purgatives are more applicable to inflammation of the brain or its membranes, than to inflammation situated elsewhere. They may, however, be employed with advantage in the early stage of pulmonary inflammations, but are inadmissible after free expectoration has commenced. They may be also employed with decided advantage in hepatitis; but the mildest laxatives are alone proper in gastro-intestinal inflammation, and even then they must be confined (at least in inflammation of the mucous coat) to the early stage of the disease.

In the acute and subacute inflammations of the brain, supervening on fever; and in the later stages of ordinary primary inflammation of this organ, when general blood-letting may no longer be safe or advisable, a gentle but pretty continuous action kept up in the bowels will be found to be of essential benefit in relieving the symptoms, and preventing the extravasation of serum within the head.

Mercury.—This is a remedy which certainly acts beneficially in

[1] Small but repeated doses of the liquor opii sedativus, with camphor mixture, may often be given with much benefit after the leeching; or, what is sometimes better—a mixture composed of the liq. opii, or solut. mur. morphiæ—carbonate of ammonia—compound tincture of cardamoms, and aq. cassiæ.

certain cases of inflammation, more particularly the following—pericarditis, iritis, croup, and those violent dysenteric and hepatic inflammations which are chiefly to be met with amongst the European residents of tropical climates. Its therapeutic action, in such cases, is not perhaps fully understood; it assuredly, however, exercises a salutary control over the inflammatory effusions.

In the above-mentioned diseases, the administration of the mercury ought immediately to follow the use of the lancet; and on no account ought it to supersede general bleeding, provided the disease be still in its acute stage, and the debility of the patient not such as to render its adoption hazardous.[1] In the acute inflammations specified, the submuriate should be exhibited in doses of from five to ten grains, (to adults,) combined with opium, every sixth or eighth hour, carefully watching the first appearance of ptyalism, and withdrawing the remedy, so that its more violent action on the system may be prevented.

The *full* action of mercury is to be carefully shunned (unless in cases of the greatest urgency) in scrofulous constitutions; and a similar caution should be observed in prescribing this remedy to individuals whose constitution has suffered much from intemperance, from poor living, depressing passions, mental and corporeal fatigue; such persons having, in fact, brought their constitution into a state closely allied to the strumous diathesis. But this remedy may be given in smaller or alterative doses with considerable advantage, in that chronic and subdued form of inflammation —tending to the gradual effusion of lymph, and consolidation of the tissues—to which the above individuals are more peculiarly liable. With this view, the mildest preparations—such as the pil. hydrarg. and the hydr. cum creta ought to be preferred; and, in particular, whenever an irritable state of the mucous coat of the stomach or intestines exists, the latter, combined with a little compound powder of ipecacuan, will be most suitable.

Opium.—Opium is inadmissible in all acute inflammations, previously to the force of the circulation being subdued by bleeding, and the bowels freely opened by a cathartic. After, however, these measures have been premised, a full dose of the liquor opii sedativus, or of the solution of muriate of morphia, may be administered with much advantage before reaction has taken place. The following are the cases in which opiates seem to be most indicated:—1st, In the acute inflammations of young children, where it has been found necessary to abstract blood from the general system to some

[1] While the pulse is full and incompressible, the exhibition of mercury will be contra-indicated; but, indeed, so long as there is high inflammatory fever, the specific effects of the remedy will rarely be produced. It is probably owing to the great intensity of the general vascular excitement in the acute diseases of young children, that mercury can so rarely be brought to act on their system; in such cases, for example, as croup and acute hydrocephalus—diseases in which this remedy has been thought by some to be particularly indicated.

extent. 2d, In females, and others of a nervous temperament, on whom blood-letting has been pretty extensively practised; also in those cases where the lancet has been employed at a late period of the disease. 3d, In all very painful inflammations, especially those involving the serous coat of the intestines, and the urinary organs. 4th, In the severer cases of dysentery. 5th, In all the acute inflammatory affections of old or debilitated subjects. Lastly, After the necessary evacuations have been procured, opiates are indicated in those cases of gout and rheumatism where the pain is great, and attended with much nervous irritation.

In some of the above cases it will be proper to give the opiate, (the solution of the mur. of morphia, or the liq. opii sedat. are probably the best preparations,) in a sufficient dose immediately after the *first* bleeding. Such, we think, ought to be the practice in reference more particularly to enteritis, puerperal peritonitis, the typhoid form of dysentery, and those mixed cases of inflammation and irritation referred to in page 23. Opium is seldom either safe or beneficial in cerebral inflammations. The constipating effects of the remedy must be guarded against in every case; and we would again remark—in no case of acute inflammation ought opium to be administered before the vascular fulness has been reduced, and the bowels cleared of all feculent matters.

Antimony.—Tartrate of antimony, (and this is the only compound of antimony that can be relied upon as an antiphlogistic agent,) may be used with great advantage in the acuter grades of inflammation, more particularly of the pulmonary parenchyma, and in which it is now customary to exhibit this remedy in solution, in doses of from one to two grains every hour or two, even to the extent of a scruple, or half a dram, in the twenty-four hours; although there are some who give a preference to doses of one sixth, or one fourth of a grain, so as only to induce slight nausea, and, in this way, control the force of the heart's action. The tart. of antimony is, however, not adapted to all inflammations. It is manifestly contra-indicated in inflammation of the gastro-intestinal mucous membrane. In young children, also, the large doses will often be found to act prejudicially, even in pneumonia, by exciting violent irritation, vomiting and diarrhœa, ending sometimes in inflammation of the stomach and bowels, or failing this, by causing great and sudden collapse of the system. Ipecacuan, or some of its preparations, may be advantageously employed in cases where antimony would be likely to act injuriously in one or other of the ways referred to.

Digitalis and Colchicum.—The former is chiefly applicable to those cases in which, the inflammatory symptoms having been subdued, a morbid irritability of the system still remains, characterised by a greatly quickened state of the circulation—a very frequent but compressible pulse. But at all times it must be employed cautiously, lest it induce sudden and extreme debility of the heart's action.

Although possessing a sedative effect, colchicum autumnale is rarely employed in any except the gouty and rheumatic varieties of inflammation, after the acute symptoms have been partially removed. It is also beneficial during the chronic stage of pericarditis, and in certain other organic affections of the heart, threatening hypertrophy. Under either of the foregoing circumstances, 15 to 30 minims of the vin. colchici, and 8 or 10 of the tinct. of digitalis, may be administered three or four times a day in a common saline or effervescing draught.

Counter-irritation.—So long as the skin continues hot and dry, and the pulse full and hard, blistering is contra-indicated; and it is only when the violence of the fever and other symptoms have declined—some degree of local inflammation still, however, remaining—that counter-irritation is found useful. Blisters appear to be more efficacious in inflammation of the serous membranes; and the tartrate of antimony ointment (which produces a pustular eruption,) in the deeper seated, and parenchymatous inflammations.

In applying blisters to young children, it is necessary to guard against an increase of nervous irritation, which in them is so readily produced by all such remedies. With this view it is preferable to allow the blister to remain on, only for a period sufficient to redden the surface well—probably four or five hours—thereafter applying a succession of hot cataplasms, in order to raise the cuticle.

Cold and hot applications.—The application of cold in the form of evaporating lotions, or iced water, is often very beneficial in superficial inflammations; also in inflammation of the brain or its membranes: hot fomentations being better adapted to abdominal and deep-seated inflammations. As a general rule, cold applications are best suited to the acute and early stage of inflammation, and hot fomentations to the later periods of the disease. But we must, to a certain extent, be directed in our choice of the one or the other by the feelings of the patient.

Cold probably acts beneficially on inflammation, by virtue of the direct sedative influence, which it exerts on the inflamed capillaries, and irritated nervous filaments. But, in order to ensure this sedative effect, we must be careful to keep the cold lotion *unremittingly* applied to the part, for a considerable space of time. Heat again would seem to act beneficially, by soliciting an increased quantity of blood towards that part of the surface to which the heated medium is applied; thereby deriving the blood from the deeper-seated inflamed parts. It will also favour the effusion of serum, and in this way relieve the capillaries from their state of distention.

Treatment of Chronic Inflammation.—In those cases where the inflammation is limited in extent, and chronic in its course; where the morbid actions are not likely to be immediately destructive to life, but only so by long continuance, and a slow process of disorganisation, the chief indication would seem to consist in averting, by an *equally measured* and *gradual* course of treatment, these

ulterior and dreaded consequences of the disease: an object which will be best accomplished—1st, by small but repeated local bleedings; unless pain and fever to some extent are present, when a general bleeding will be required. The loss of six or eight ounces of blood will, in this case, generally be sufficient to reduce the excitement, although the urgency of the symptoms may possibly demand the sacrifice of a larger quantity; since, however, a state of general debility is commonly prevalent in this class of inflammations, it is of the greatest importance to economise the strength of the patient as much as possible. In the chronic inflammation of deep-seated parts, (*e. g.* the central parts of the lungs, liver, and kidneys,) local bleeding produces comparatively little effect, and, in such cases, therefore, it may be necessary to practise a *small* general bleeding from time to time; and cupping will be found to be much more advantageous than leeching. If the inflammation be of considerable standing, the local bleeding will often afford most relief, when employed at a distance from the seat of affection,—on the principle of derivation. 2d, By counter-irritation, with small blisters frequently repeated, or such other substances as keep up a continued excitement in the superficial vessels of a part, accompanied with a purulent discharge, *e. g.* issues, setons, and tartar emetic ointment. This measure also, like local bleeding, is often most advantageously employed at some little distance from the seat of disease. 3d, By friction, and such other means as are calculated to maintain the heat of the extremities, and the general surface of the body, without, however, being productive of any general excitement of the circulation. 4th, By a steady adherence to a mild tonic regimen; consisting, more especially, in gentle and engaging exercise in the open air, surrounded by a dry and temperate atmosphere—a nourishing but unstimulating diet, composed of farinaceous, and small quantities of plain animal food—sponging the body, at first with tepid, afterwards with cold water mixed with a little vinegar or salt, (as a substitute for the salt water shower-bath,) followed by friction. 5th, By a course of gentle laxatives, combined with alteratives, and such of the tonics as are least stimulating;[1] or a course of mineral waters possessing laxative and alterative qualities, such as those of Harrowgate, Cheltenham, or Leamington. And *lastly*, By a careful avoidance of every kind of excess, and every source of irritation, mental and corporeal; and as far as practicable of the common exciting and predisposing causes of inflammation.

The same principles of treatment are applicable, with slight

[1] A combination, for example, of sulph. zinci, myrrh, ext. hyosci. nig. and rhubarb, in the form of pill—the latter in such proportion as to act very gently on the bowels; along with infus. of quassia, cascarill. and carb. of soda. And in some cases where the secretions are much disordered, and the bowels irregular, an alterative powder every other night of four or five grains of hydrarg. cum creta, and a grain of ipecac.; or should the bowels be lax, two or three grains of the compound powder of ipecacuan.

modification, to all the subdued forms of the disease,—such as the *scrofulous* inflammation; and also to those congestive affections which pursue a chronic course.

CHAPTER III.

HEMORRHAGE.

General Pathological Characters.—The effusion of blood into any of the organs, cavities, or mucous passages of the body, which is not the consequence of a wound, or other mechanical injury, but of congestion, of increased action of the vessels, of diseased states of their coats, or of an altered condition of the blood itself, is, in the language of medical pathology, styled a *hemorrhage*.

Hemorrhages are usually divided into *active* and *passive;* also, into *idiopathic* and *symptomatic*. In those which are idiopathic, the blood escapes from the vessels in the absence of any *appreciable* change of structure, either in their coats, or in the membrane, which is the seat of effusion, or in any neighbouring or more distant organ, which might be supposed to operate as an immediate or remote cause of hemorrhage, by inducing an irregular distribution of the blood. On the contrary, in the symptomatic hemorrhage, there is manifest pre-existing disease of some part or other, (*e. g.* disease of the heart, or tuberculated lungs in the case of pulmonary or cerebral hemorrhage,) which has been more or less directly instrumental in its production. It is, indeed, in connection with organic lesions—which are permanent and powerful predisposing causes of congestion—that the greater number of hemorrhages arise. The cases which are primary and idiopathic are, therefore, comparatively few. When they do occur, they are commonly of the active kind; and are met with oftener in the plethoric, and before, than after puberty.

Passive hemorrhages are most frequent in the decline of life, and during states of debility,—when the tonicity of the vessels has been greatly impaired, and when the blood is deteriorated, thin, and watery, and little disposed to coagulate, as happens more particularly in certain diseases alluded to in a former chapter—(see p. 4) —and in typhoid fevers, and other malignant affections. Further, in truly passive hemorrhages, blood is often effused from several organs simultaneously, particularly from their more dependent parts; for example, from large tracts of the gastro-intestinal, and genito-urinary mucous membranes.

General Symptoms.—1*st, Of Active Hemorrhage.*—This form of the complaint is by no means always characterised by a distinct febrile movement, or even by very obvious symptoms of local

increased action, unless in young and plethoric subjects. When, however, the hemorrhage proceeds from an important organ, (*e. g.* the lungs,) it is very generally preceded by some degree of languor, lassitude, and chilliness, cold extremities, a pallid countenance, and a small unequal pulse, followed by a sense of heat, weight, tension, or fulness, (often slight, indeed,) referable to the particular organ or region of the body from whence the blood is about to issue. In this case, the blood, as it escapes from the vessels (if not retained within the tissues, but immediately discharged through some of the natural passages,) will exhibit the arterial hue, as also a disposition to coagulation; and should the flow of blood not be very profuse, a relief from all the foregoing symptoms of general and local uneasiness will speedily be experienced, in consequence of the local congestions, or the hemorrhagic impetus—which immediately preceded the flow of the blood—being now removed.

But, in a great many instances of internal hemorrhage, the case does not terminate here. The effusion of blood is liable to recur again and again, for several days, at short intervals; and, in which case, as also when the effusion has in the first instance been rapid and profuse, there will arise a constitutional disturbance, characterised by much irregular excitement or irritability of the nervous system. When the patient falls into this state he betrays much perturbation and alarm, much mental and corporeal anxiety, a countenance alternately flushed and pale, followed by an inordinate reaction of the heart and arteries—a hot dry skin, a furred tongue, and a pulse, which, formerly small and irregular, is now remarkably full, bounding, and throbbing. From this character of the pulse, (sometimes denominated the *hemorrhagic* pulse,) the student might be led to conceive that the hemorrhage is always, under such circumstances, a sthenic disease—associated with a phlogistic diathesis, or with an actual inflammatory state of the vessels. In many instances, however, no such condition exists; and, indeed, where this state of the pulse, and other symptoms of constitutional irritability to which we have just referred, are most prominently portrayed, there is often much more danger to be apprehended from the employment of active antiphlogistic measures, than from even an opposite line of treatment. It will, however, be soonest allayed by gentle laxatives, sedatives, perfect rest, and moderate quantities of nourishing food.[1]

These symptoms of reaction will bear some proportion to the quantity of blood effused—to the importance of the affected organ in the animal economy—to the extent of its sympathies with other organs or systems of the body, and to the degree of functional embarrassment created by the presence of the effused blood, in situations where it has not been able to find an egress. Nevertheless,

[1] For a detailed and instructive account of the peculiar symptoms arising from loss of blood, the student may consult a work of Dr. Marshall Hall's, entitled "the Morbid and Curative Effects of loss of Blood."

it sometimes happens that a comparatively trifling loss of blood will be followed by high excitement; although this no doubt is most observable when a state of increased nervous excitability, and consequent susceptibility to morbid impressions, has been established by the continued operation of debilitating causes—more particularly the depressing passions—for some time previous to the occurrence of the hemorrhage. The greater the severity of the reaction, the more reason will there be to apprehend a recurrence of the hemorrhage; and, therefore, until the irritability of the system has been subdued by proper remedies, or has spontaneously subsided, the patient should not be considered free from danger.

2d. *Of Passive Hemorrhage.*—In the truly passive hemorrhage we discover no indications either of a general or local increased action—the flow of the blood from the capillary vessels is not preceded by any of those signs of a *molimen hemorrhagicum* to which we have just alluded; on the contrary, every circumstance in the case affords proof of real debility. The effused blood is of a dark purple hue; does not coagulate; and, in place of the hemorrhage spontaneously ceasing after a moderate discharge, with relief to the symptoms of local and general oppression, on the contrary it is with difficulty suppressed, and has the effect only of adding to the previous debility of the patient; while the disposition to its renewal —when stayed for a time by art or otherwise—is apparently increased in proportion to the loss sustained by the vessels, instead of being diminished, as was observed to be the case in regard to the active form of the disease. The blood, also, is not unfrequently poured forth from several organs or structures simultaneously.

But these distinctive characters of active and passive hemorrhage are often considerably modified, so as to make it difficult for the practitioner to assign the class to which the case belongs. Thus, a hemorrhage which is accompanied by increased vascular action, may be met with in connection with much general debility, and even with the dissolved state of the blood to which we have so often referred. On the other hand, a hemorrhage occurring in a vigorous or sthenic state of the system, may be attended with very few and slight symptoms either of a local or general increased vascular action. Accordingly, in all cases, the circumstance which, in a *practical* point of view, demands the greatest consideration, is, whether or not the hemorrhage occurs in an individual who is labouring under *asthenia*, or in one whose constitutional powers are tolerably vigorous and unimpaired. Finally, from the close analogy between the pathological condition of the vessels in active congestions, inflammations, and hemorrhages—the one being readily convertible into the other—there is much reason for believing that those cases of the latter affection, which are accompanied with much general and local vascular excitement, originate in a state of the capillaries very nearly allied to the former; but with which is commonly conjoined an irritable condition of the system, and not

unfrequently some peculiarity in the quality of the circulating fluids.

When hemorrhage takes place into a shut cavity, or into the parenchyma of important organs—the lungs or brain for example—a more or less serious embarrassment of function will be produced, terminating occasionally either in sudden death, or in inflammation and its consequences. When the blood for instance is effused in considerable quantity into the vesicular and cellular tissue of the lung, more or less dyspnœa is produced, followed by cough, with or without hemoptysis; while over a part of the chest corresponding to the portion of lung occupied by the extravasated blood—provided it be not confined to a small central portion of the organ—there is either a partial or total suppression of the respiratory murmur, or in the event of the blood still remaining fluid, a limited but distinct crepitating rale. And again, when blood is extravasated into, or over, the surface of the brain, there follows—according to the rapidity with which the blood issues from the vessels, and according to the particular part of the organ into which it escapes, and quantity thereof—partial or complete abolition of sense and motion, and other symptoms, which will be noticed at a future period. While, should the quantity of blood be great, and rapidly discharged from the vessels—even into parts whence it finds a ready exit, *e. g.* the mucous passages, where function is little interfered with—the patient may suddenly expire in a fit of syncope or convulsions. But what is more common, a repetition of the hemorrhage at short intervals gradually subdues the energies of the patient, so that at length reaction becomes defective, and he sinks into a state of exhaustion, accompanied often with delirium, ending in fatal coma.

Death is seldom, however, an immediate consequence, unless in the case of hemorrhage within the head—from the uterus after parturition, or during the latter months of pregnancy—or from the erosion or rupture of one or more vessels of considerable size, as sometimes happens, for instance, in a case of phthisis pulmonalis, or from the softening of an encephaloid tumour in the stomach.

State of the vessels in hemorrhage, and post mortem appearances.—The extreme vessels (arteries, veins, and capillaries,) belonging to the particular organ or structure whence the hemorrhage proceeds, are, in a number of cases, in a previous state of congestion—the congestion (in the active hemorrhage at least,) being gradually removed, while the blood continues to escape from the vessels, and which it does in by far the greater number of instances, in the way of exhalation, *i. e.* by permeating the invisible pores or orifices of the minute vessels.

The only post mortem appearance, accordingly, which we meet with in fatal cases of *idiopathic* hemorrhage, is a greater degree of vascularity and redness than is natural to the part; unless where the blood has been extravasated into a shut cavity or parenchyma, in which case coagula will be lodged amongst the tissues, and in

some instances laceration, and other disorganisation, produced. A condensation of the surrounding textures will be the consequence in one case, and softening in another. The former is the effect commonly resulting from extravasation of blood into the pulmonary parenchyma; and the latter from a similar effusion into the substance of the brain. Such, however, are only contingent and ulterior effects of the hemorrhage, not being observable until some time after the effusion has taken place. and then very often, in some measure, owing to the supervention of an inflammatory action to which the vessels have been excited by the presence of the effused blood. In other instances the softening is the effect of previous inflammation, and the hemorrhage a consequence of the extension of the former to the coats of the vessels;—such is not unfrequently the course of events, in the brain, and in the gastro-intestinal mucous membrane. Suppuration and mortification have also been observed to ensue after hemorrhage. Both of these circumstances are, nevertheless, extremely rare; and have been met with in those cases only where blood has been largely extravasated into the lungs or brain of old and enfeebled persons.

When the blood has not been ejected from the body through one or other of the natural passages, but retained—as must necessarily be the case when it has been poured into a serous cavity, or into a parenchymatous or cellular tissue—it is then either gradually and entirely removed by absorption, as happens not unfrequently in pulmonary apoplexy, no visible trace of its existence remaining after the lapse of a few weeks; or the fibrinous portion of it being left behind, is organised and converted into an adventitious structure—occasionally laying the foundation of various tumours. Organisation of effused blood has been chiefly met with in the brain, in cellular tissue, and in serous cavities; but oftenest in the first of these situations.

It was formerly remarked, that hemorrhage might originate in the actual rupture of one or more vessels of considerable size. This is undoubtedly, however, much seldomer than exhalation, the source of the disease, and mode of its production. The actual rupture of the coats of a considerable artery or vein is at all times comparatively rare; and it is only during the later periods of life that it is likely to happen, when in consequence of the conversion of the middle and inner coats of the arteries into steatomatous and calcareous matter, and the loss of elasticity consequent thereon, they are liable to be ruptured by any sudden and unusual impulse given to the circulation.

The conversion of the inner coats of arteries into calcareous matter is most frequently seen in the vessels of the brain, more particularly in the basilar artery and its branches; and hemorrhage proceeding from actual rupture of vessels is therefore a much more common occurrence in the brain than elsewhere. There are probably, indeed, few cases of cerebral hemorrhage occurring in the *later* periods of life, in which disease of the vessels, to some extent,

will not be discovered on minute investigation: and it may be here also remarked, that in many cases of apoplexy the left ventricle of the heart will be found hypertrophied. These circumstances, coupled with the fact of the arteries of the brain deriving no support from a cellular or outer sheath, will sufficiently account for their much more frequent rupture, upon the application of any occasional cause which either impedes the descent of the blood from the head, or determines it with undue force towards it—compared with the rarity of this occurrence in the other parts of the body. The arteries of the mucous membranes appear to be seldom or ever affected with ossific degenerations, and consequently in *epistaxis*, *hematemesis*, *melæna*, and *menorrhagia*, the blood commonly escapes by exhalation; more rarely it proceeds from ulceration of the membrane—for example, from fungoid or cancerous ulcerations, occupying the greater or lesser extremity of the stomach, the flexure of the colon, the rectum, or the uterus. And exhalation is the manner, also, in which pulmonary hemorrhage (bronchial as well as vesicular) takes place, if we except those occasional instances, in which the blood proceeds from vessels which have been suddenly laid open in the progress of tubercular ulceration of the organ. We may conclude, therefore, that an engorgement of the extreme vessels takes place antecedently to the hemorrhage in all cases, (which are not the effect merely of a surgical or mechanical injury,) with the following exceptions: 1st. Where the vessels have been perforated in consequence of softening, and ulceration of their coats; or from having become involved in a gangrenous and sloughing process, such as occasionally happens during the progress of fungoid and cancerous ulcerations of the stomach, intestines, or uterus; or where they have ruptured simply in consequence of a loss of elasticity from ossific or other morbid deposit. And, 2d. Where the blood has undergone such a loss of plasticity, and change in its other properties, as renders its retention within the vessels difficult.

Remote Causes of Hemorrhage.—Besides constitutional predisposition, and the influence of certain physiological laws which regulate the growth and development of the different organs and structures of the body, all the other circumstances, and conditions, which were formerly specified as being productive of irregular distributions of the blood and of local congestions, will be found to act as predisposing, and occasional exciting causes of hemorrhage.[1] It has been observed that the predisposition to hemorrhage is sometimes hereditary, in which case it is very liable to recur at stated periods; and also that hemorrhage, especially in the female sex, is occasionally vicarious or supplementary of other discharges,—as, for example, when hemoptysis or hematemesis appears in place of the catamenia, or of the hemorrhoidal flux. In these cases, also, the hemorrhage is apt to recur periodically.

[1] Vide p. 8, et seq.

Seat of Hemorrhage.—Blood may be effused into any of the soft structures of the body,—the lungs, brain, liver, spleen, kidneys, uterus, stomach, intestines, serous, cellular, mucous membranes, and skin—but much more frequently from the mucous membranes than from any of the others. In youth, and in early life, hemorrhage is most frequent in that portion of the mucous membrane which lines the nasal passages and bronchi; and in the later periods of life in that division of it which lines the alimentary canal and genito-urinary passages; while at a still more advanced period of life, it is most apt to take place in the brain. Again, hemorrhage, from the serous and cellular membranes—which is, however, at all times comparatively rare—is very generally the effect of acute inflammation, or diseased states of the vessels.

Treatment of Hemorrhage.—In forming indications for the treatment of a case of hemorrhage, we ought, in particular, to ascertain the nature of the exciting and predisposing causes, and the primary or secondary character of the affection—*i. e.* whether or not it is associated with organic lesion, or pre-existing disease of some kind or other; and the constitutional powers of the patient ought, in every case, to be duly considered.

The following may be viewed as primary indications:—1st, To diminish any increased vascular excitement which may be present. The judicious application of antiphlogistic measures, and more particularly strict attention to diet, and other points of regimen, will be required for the fulfilment of this indication: nauseating doses of tartrate of antimony or ipecacuan may be also useful, more particularly in hemoptysis,—at the same time avoiding vomiting. In *pulmonary* and *cerebral apoplexy*, blood-letting must be promptly employed; and when the patient is neither old nor debilitated, and we have no reason to suspect the hemorrhage to be connected with organic disease of the heart or lungs, or coats of the arteries, (rather a rare case, indeed,) it will be both safe and proper to carry this measure to the utmost limits of the patient's strength, should the severity of the symptoms require such a sacrifice;—but whatever may be the circumstances of the case, free purging is sure to be productive of the greatest benefits. Nevertheless, as a general rule, blood-letting should be cautiously employed in the treatment of hemorrhage; both because it is liable to increase that state of nervous excitement which we mentioned to be a frequent concomitant or consequence of the sanguineous effusions; and because most hemorrhages—with the exception of those *idiopathic* and *constitutional* ones which occur in the young and plethoric, and which rarely require medical interference, seeing that they operate their own cure—are connected with irremediable organic lesions, or with states of the system characterised by much general debility. 2d, To equalise the current of the blood by diverting it towards the extremities and surface of the body; thereby relieving the local congestions and the hemorrhagic impetus. Saline purgatives, hot pediluvia, or fomentations to the extremities, together with leeching

and cupping, and counter-irritation, are the means best suited to the fulfilment of this indication. 3d, To moderate the re-action and nervous excitement, which, as formerly observed, are so apt to supervene on great or repeated losses of blood. The following are the different means which assist in fulfilling this indication:—The observance of a perfect quiescence of mind and body; the careful abstraction of all external and internal stimuli; the maintenance of the horizontal posture, except in the case of hemorrhage within the head, when the trunk and head should be somewhat elevated; a free circulation of cool air; sponging the body with tepid vinegar and water; and the administration of various sedative medicines, particularly digitalis, camphor, hyosciamus, and the different preparations of opium; together with moderate allowances of mild unstimulating articles of diet. And the *last* indication of treatment consists in endeavouring to constringe the small vessels from which the blood issues. This is an indication for the accomplishment of which various astringent or *styptic* remedies, and substances supposed to be possessed of a refrigerating quality, have been long in use—such as the nitrate of potash, the vegetable, and the mineral acids, particularly the sulphuric; the sulphate of alumina, the sulphate of zinc and copper, the muriate of iron, rhatany root, kino, and other articles containing gallic acid. As, however, such substances undergo alteration in their properties before they are taken into the circulation, their utility as means for accomplishing the present indication is very dubious, excepting in nasal hemorrhage, and in hemorrhage from the stomach, uterus, rectum, or bladder, in which situations the styptic may be brought to act directly on the bleeding surface. Cold, however, (in the form of iced water,) and the acetate of lead—both of which possess a sedative as well as an astringent property—must be excepted from the foregoing remarks, being most powerful remedies for the suppression of all internal hemorrhages—passive as well as active—and remedies, moreover, which may be employed in most cases with perfect safety. It is only here necessary to observe, that the acetate of lead ought to be combined with opium, and constipation prevented by the administration of occasional doses of castor oil; and that the remedy may often be exhibited with safety and benefit to the patient up to the extent of ten or twelve grains in the course of the day. In some passive hemorrhages, where the debility is great, small doses of wine and other diffusible stimuli, with nourishing diet, will be required; along with the pills of acetate of lead and opium, and hot fomentations to the extremities. Small doses of ol. terebinthinæ (twenty drops,) have also proved useful in the passive forms of hematemesis and melæna.

In the treatment of hemorrhage occurring in the course of malignant fevers and other diseases originating in specific causes, as also in cases of *Purpura Hemorrhagica*,—in all of which the blood appears to have undergone such a remarkable change in its qualities as, in some instances, to issue forth from the mucous mem-

branes, skin, cellular, and occasionally, also, from the serous and parenchymatous structures, simultaneously, in the form of a very thin dark-coloured fluid—it will be advisable to try the effect of such a mixture of neutral salts, as Dr. Stevens and others have considered to be serviceable in malignant cholera, and bad tropical fevers;—on the principle of restoring to the vitiated blood those saline ingredients in which, under the circumstances and in the cases referred to, it is from chemical analysis believed to be greatly deficient. The combination consists of from twenty to thirty grains of carb. of soda, half this quantity of the muriate, and six or eight of the chlorate of potash. Calomel and opium will also, in some instances, be found useful, in the dose of one or two grains of the former, and one of the latter; while, in the absence of any unusual heat of the skin, or sharpness in the pulse, (although quick,) small quantities of wine, nourishing diet, and small but repeated doses of sulphate of quinine, will be likely to prove beneficial. The vegetable acids have been also much recommended, in cases of *purpura*, grounded on an analogy between it and *scorbutus*, as regards several of the symptoms and causes common to both. Some instances there are, however, of the former disease, wherein, being accompanied with considerable vascular excitement and strength of constitution, moderate bleeding, and especially the free use of laxatives, would seem to be the more appropriate remedies.

After having completely subdued the hemorrhage, it still remains for us to institute certain *prophylactic* measures, since from the connection of many of the cases with constitutional causes, altered states of the fluids, and organic lesions—all acting as *permanent* predisposing causes—the patient continues greatly exposed to subsequent attacks of the disease. Accordingly, with this view, all causes which in any way tend to disturb the circulation, and induce local congestions of blood, ought to be carefully avoided, or removed if still operating on the system; and where this is not altogether practicable—as must often happen, in consequence of organic lesions existing which we cannot hope to remove—it is yet in our power to preserve the patient from many assaults of the complaint, which he would otherwise sustain, by putting him on his guard against all those *occasional* causes which have a tendency either to hurry the general circulation, or to retard the free movement of the blood in any organ or region of the body—such, for example, as stooping, straining, and severe bodily exertions of every kind, loud and long continued speaking, too full a diet, the use of spirituous liquors, constipation, mental excitement, close and heated apartments, &c.; while, should any of the natural or habitual discharges of the body be suppressed, such means must be employed as are best calculated to effect its restoration. And in like manner, when the hemorrhage appears to be connected with a general fulness of the vessels, or, on the contrary, with marked debility, such a mild antiphlogistic treatment as will *gradually*

remove the former condition of the system ought to be adopted; while, on the other supposition, the patient is to be put on such a course of tonic treatment as will renovate his strength, without producing excitement.

CHAPTER IV.

DROPSY.

General Pathological Characters.—Dropsical affections have in many respects an intimate relation to those conditions of the vascular system, already described under the heads of active and passive congestions—more particularly the class of *mechanical* congestions; and the predisposing and exciting causes of the latter (see p. 7 and 9,) will be found to be those which are chiefly instrumental in the production of the former: although, in the greater proportion of dropsies, a degree of local vascular excitement, amounting often to actual inflammation, is *superadded* to those visceral organic lesions, which so powerfully predispose to the disease in question, by obstructing the free movement of the blood,—through the venous system more especially.

The word *dropsy* is employed to signify a preternatural collection of a serous or watery-looking fluid, in any of the shut cavities, or common cellular membrane of the body—situations where, in health and during life, nothing but a halitus or moisture is perceived; but where, in certain local as well as general, diseased states of the system—not necessarily, although frequently, associated with inflammatory action either of the exhaling membranes themselves, or of the neighbouring organs—the natural process of exhalation preponderates over that of absorption, by reason of increased activity in the former function, and probably also, in some cases, by reason of diminished activity in the latter.

As the greater number of dropsies is therefore to be viewed as constituting *part* of a disease only—and that often of a very complicated nature—and consequently as secondary or consecutive, and not primary or idiopathic affections, it becomes necessary for practical purposes to endeavour, in each case, to ascertain the morbid conditions of the system generally, as well as of certain organs in particular, which pathological research has shown to be more immediately or remotely concerned in the production of this class of diseases.

Morbid anatomy, and remote causes of dropsy, with their mode of action.—The morbid appearances which have been met with after death in connection with dropsical effusions are very various. Some of them—for example, thickening, and opacity of the serous

membranes from albuminous exudations—are to be viewed as co-existing effects of the inflammatory action, which, though not essential to the formation of a dropsy, is nevertheless found in a great many cases powerfully co-operating with the visceral obstructions (presently to be noticed) towards its production; while others, such as the blanched, softened, and condensed state of the structures belonging to a dropsical cavity, are appearances which may often, in part, be ascribed to the maceration and pressure sustained from the accumulation of fluid in a shut cavity. And we may here also observe, that, when the dropsical effusion is great, those organs which, from their locality and fixed position, are more directly exposed to its pressure, will often be found atrophied; in consequence of the nutritive secretion from the capillaries of the organ thus acted upon, being more or less impeded, at the same time that its interstitial absorption—a process at all times much favoured by compression—is proceeding in an inverse ratio. This observation in regard to diminution of organic bulk, as well as the preceding, will be found to apply more particularly to the state of the brain and lungs, in the chronic cases of hydrocephalus and hydrothorax. In the abdomen, such effects are in general much less observable, the pressure of the fluid being comparatively trifling; because of the very yielding nature of the parietes of the cavity, and the shifting and floating condition of most of the contained viscera. And, for the same reason, the abdominal viscera often suffer little interruption of function, compared to the organs of other serous cavities, when the seat of effusion; and even in a case of ascites, where the quantity of fluid is very great, we commonly find dyspnœa to be the most urgent and distressing symptom, owing to the diaphragm being forced upwards by the pressure of the fluid, so as greatly to circumscribe the natural capacity of the thorax.

Of organic lesions operating as remote causes of dropsy, the following appear to be the most important:—*First, of the lesions of the organs of circulation.*—Almost every form of structural disease of the HEART—whether of its muscular parietes, its valves, its investing or lining membrane—has been discovered in connection with dropsy; nevertheless it is most apt to supervene on active or passive dilatation of one or more of its cavities, when conjoined with valvular disease of such a nature as to offer an impediment to the free transmission of the blood from the right side of the heart to the left, through the pulmonary vessels, or from the left side of the heart to the right, by the systemic arteries and veins. The coats of the ARTERIES are often found diseased in dropsy. Steatomatous and bony deposits are, for example, very common; while aneurisms and dilatations, more particularly of the ascending aorta, are not unfrequent. Thickening, induration, and obstruction of the VEINS, from fibrinous effusions, have also been found in connection with dropsy—of the iliac and crural veins, for example, from the extension of inflammation commencing in the

uterus after parturition. The LYMPHATIC vessels have also been described as exhibiting different states of disease in dropsy, particularly as having been found dilated and indurated; but the influence of diseased states of this system of vessels, in the formation of dropsical effusions, is not at present satisfactorily determined; and the same may be affirmed of the opinion which has been so often advanced, that dropsies are owing in certain cases to a diminution of the vital power of the absorbents, independently of any disordered action of the exhalent vessels.

Second.—Of the lesions of the organs of respiration.—These organs, like the former, have been discovered in various states of disease in cases of dropsy. The most important, however, are the red and gray *hepatisations* or indurations, which are the sequelæ of acute, though more frequently of chronic, peripneumony; and, secondly, those condensations of the pulmonary parenchyma, which result from the presence of calcareous, tubercular, encephaloid, and melanotic deposits, in the lungs or pleura. During the developement of these extraneous matters, and their progress to a state of softening, subacute attacks of pneumonia extending to the pleura are of very frequent occurrence—and then it is that dropsy is most apt to supervene; for tubercular disease of the lung does not readily lead to dropsical effusions, unless combined with some degree of inflammation.

Third.—Of the lesions of the abdominal and pelvic viscera.—Diseased states of the liver, kidneys, spleen, mesenteric glands, uterus, ovaria, and peritoneum, have in different instances been found associated with dropsical effusions.

1. Every variety of lesion has been met with in the LIVERS of those who have laboured under dropsy; but that which appears to predispose to the disease with most certainty is the *nutmeg* degeneration; and also the *granular*—which is now usually considered to be an aggravated variety or advanced stage of the former. This state of the viscus is very generally attended with diminution of volume and increased density; and it is when these conditions are combined with the former that dropsy (commonly ascites,) is so certain a consequence.[1] The nutmeg or granular degeneration

[1] The first step towards the granular formation above referred to, would appear to consist in hypertrophy of the yellowish white substance of the liver; which, however, in progress of time presents the appearance of a number of corpuscles pervading every part of the viscus, chiefly composed of concrete lymph. As these granular bodies slowly enlarge, they encroach upon the intervening healthy tissue of the gland; and, by their pressure, cause so much absorption of it, that ultimately no trace of the natural structure remains—and from which, also, there results much condensation, induration, and shrinking of the organ; and, as an additional consequence, the biliary secretion is much diminished, and is for the most part of unhealthy quality.

It is not certain how far this morbid formation is due to inflammatory action; but considering the circumstances under which it is most apt to take place, it seems highly probable that a low degree of inflammation is

commonly pervades the whole or the greater part of the viscus, differing in this respect from the carcinomatous,[1] melanotic, and hydatid formations, which are usually more or less isolated. And, accordingly, since those alterations of structure which are general, necessarily occasion greater obstruction to the circulation of the blood through the system of the vena portæ; and—what is also very important to be observed—occasion a greater disturbance of the biliary secretion, than those lesions which are partial or circumscribed, we can perceive the reason why a granulated state of the liver is so very frequently succeeded by dropsy. But this, no doubt, is only a part of what takes place, prior to the establishment of dropsy from diseased liver; for there is reason to think that in such cases the general mass of circulating fluids becomes deteriorated, owing to the imperfect manner in which the liver discharges its functions; and also that a state of irritation is induced, which at length shows itself in the form of a subacute inflammation of the peritoneum—which latter circumstance greatly hastens, if in the first instance it does not originate, the serous effusions.

2. The SPLEEN being seldom the seat of important lesions—excepting in persons who have been exposed to the influence of tropical climates, and who have suffered much from intermittent fever—it is only necessary to say, that dropsy supervening upon disease of this viscus, will in most particulars correspond with what has just been mentioned in reference to dropsy from diseased liver; for, indeed, when the former organ is diseased, the latter will also be found in many cases somewhat affected.

3. Enlargements of the UTERUS or its appendages, resulting from various morbid growths, may give rise to dropsy, either by producing direct pressure on the large bloodvessels in the neighbourhood (*e. g.* the iliac veins,) or by the extension of irritation

the cause; for it is seldom that this lesion occurs, unless in cases where the organ has been long subjected to undue stimulation, or repeated congestions of its vessels—such as we know to be produced by the inordinate use of ardent spirits, stimulating viands, long exposure to tropical heats, the slow action of malaria, intermittent and remittent fevers, and by organic disease of the heart or lungs obstructing the return of the blood by the vena cava, &c. These granular bodies are considered by some to be a modification of tubercle. But although, in their early stage, they bear a close resemblance to each other, still they differ in one or two important particulars. Thus, the granular deposits *harden* with their growth—rarely showing that tendency to *soften* and suppurate, which is the characteristic of the proper (scrofulous) tubercle; while they further differ from the latter in seldom occurring before the middle period of life, and in being more uniformly connected with chronic inflammation or irritation. In the kidneys, the mode of developement, progress, and effects, of these granules, are in most respects similar to what has just been stated in reference to the liver. They are also sometimes met with in the serous membranes of the chest and abdomen; and when so situated, they not unfrequently acquire a cartilaginous, or even an osseous, consistency.

[1] The "large white tubercles" of Dr. Baillie, and the "tubera circumscripta" of Dr. Farre.

and inflammatory action from the diseased viscus to the general cavity of the peritoneum.

4. It has been fully proved by the recent investigations of several eminent pathologists, that diseased KIDNEY holds a conspicuous place in the etiology of dropsy. The various lesions of these organs giving rise to dropsical effusions have been fully described by Drs. Bright, Elliotson, Christison, Gregory, and others; it will be only necessary, therefore, to state, that they bear a very close resemblance to those of the liver, being chiefly varieties of the *granular* degeneration—three of which are particularly noticed by Bright. The observations which were made in reference to the manner in which the nutmeg or granular liver operates in producing dropsy will be equally applicable to the present case, viz. that the disease, which is most apt to be followed by effusion, is that which has effected a change, not in a part, but in the substance of the gland generally; and which, consequently, not only causes a very considerable obstruction in the renal circulation, but also seriously impedes the *function* of the gland; so that certain ingredients of a deleterious quality, which are formed in the course of the general circulation, and which are destined to pass off at the kidney, along with the watery part of the blood, are retained, until becoming productive of disturbance of the general system, and, probably also, of irritation in the exhalent surfaces, dropsy is at last established. And we may here also observe, that the same causes—particularly habitual excess in the use of spirituous liquors—which give rise to granular degeneration of the liver, prove equally efficacious in inducing a granular state of the kidney; and although dropsy may originate solely from disease of the kidney, nevertheless it is much more frequently the consequence of disease affecting the one and the other of these organs simultaneously—sometimes with the additional complication of bronchitis, or diseased heart.

In other instances, however, the effusions do not appear to be connected with any obvious change in the *structure* of the kidney, but rather with a subacute inflammatory or congestive state of the organ. When this is the case, they are for the most part suddenly and rapidly produced, are accompanied with more or less fever, and extending to all the serous cavities of the body, the life of the patient is not unfrequently terminated by the supervention of coma. Moreover, the cases of this description (primary inflammatory dropsies,) are very often attended with some degree of bronchitis, which greatly adds to the danger of the patient, not only by augmenting the general dropsy, but by causing effusion of serum into the air cells and cellular tissue of the lungs, (*œdema pulmonum.*) This inflammation, or acute congestive state of the kidney and air passages, may generally be traced to the same exciting causes, namely, exposure to cold and wet, and such other agents as have the effect of suddenly checking the cutaneous or other habitual discharges of the body; at a time more especially when they happen to be profuse, and when the system has been debilitated by fatiguing

exertions, or by previous disease, particularly the exanthemata, and other febrile and inflammatory affections, *e. g.* scarlatina and measles—diseases which not only leave the cutaneous vessels, but also the vessels of the mucous membrane of the air passages, in a state of unusual susceptibility to atmospherical and other external impressions. The sudden interruption of the uterine discharge, or of the hemorrhoidal flux, or of a diarrhœa, will, in certain constitutions, be readily succeeded by inflammatory dropsy;—in all of which cases, the kidneys are very commonly the seat of a subacute inflammation, with or without pneumonia, or other coexistent disease.

5. Tumours of different kinds in the CAVITY of the abdomen, folds of the mesentery, or omenta; tubercular enlargements of the mesenteric glands; and tubercular accretions of the peritoneum, have all been met with in connection with dropsy,—the effusions being in such cases chiefly confined to the abdomen.

The numerous organic lesions, to which allusion has now been made, although, assuredly, the most frequent, most important, and most influential, of the remote causes of dropsy, are not, however, the sole agents in its causation; nor are they of themselves sufficient, in general, to induce it. When, however, they do exist at any time, to such an extent as seriously to impede the natural current of the blood, and interrupt any of the secretions or excretions, or the function of assimilation and hæmatosis, (to which the liver and lungs are both subservient,) the supervention of often very slight degrees of increased action of the heart, or of the vessels of the lungs, kidney, liver, or of the serous membranes themselves, will suffice to produce the effect.

The following appear to be the chief causes which co-operate with the forementioned organic lesions in giving rise to dropsy:—1st, Long and frequent exposures to a cold and moist atmosphere, and living in low and damp localities, whereby the cutaneous as well as pulmonary transpiration is lessened. 2d, Profuse evacuations, especially repeated losses of blood, from the uterus, or by the lancet, or in any other way. 3d, Poor and unwholesome diet, insufficient clothing, impure air, habits of inebriety, and all other circumstances that tend to enfeeble the powers of life; as also many chronic ailments, which, although unattended with change of organisation of any part of the body, are yet productive of gradual exhaustion, and probably, also, of alterations in the properties of the blood. 4th, A natural peculiarity of constitution, usually styled the *phlegmatic* temperament—characterised by a lax state of the muscles, a pale and soft skin, weak and languid circulation. *Lastly*, the sudden action of cold on the body, checking the discharges from the skin, uterus, or intestinal canal, when more than usually profuse, or causing the retrocession of cutaneous eruptions, and congestion or inflammation of the lungs; and the swallowing a quantity of cold water when the body is much overheated and fatigued—are well known *occasional* causes of dropsical effusions.

Some of the remote causes specified under these latter heads will, in a few instances, independently of any organic lesion, give rise to dropsy. It occasionally succeeds, for example, to great losses of blood, or severe diarrhœas, where no structural lesion whatever exists; and in which case the dropsy may be constituted simply by *transudations* of the serous part of the blood—*i. e.* be purely an effect of debility of the vessels, and a watery state of the blood. On the other hand, the sudden suppression of customary discharges, or cutaneous eruptions—happening especially in persons who are plethoric, but in whom the vital movements are at the same time somewhat sluggish—will be found to favour most the production of the sthenic or acute dropsies—*i. e.* dropsies originating either in actual inflammation, or in a phlogistic diathesis; and which, like the former, may in some instances be altogether independent of any structural lesion.

From the foregoing account of the morbid anatomy and causes of dropsy, it will appear, *first*, that dropsical effusions cannot be referred to the operation of one single and uniform train of causes, but that anasarca, ascites, or any other form of the disease, (with the exception of hydrocephalus, which, there is reason to believe, is always in some degree dependent on inflammation within the head,) may originate in a variety of remote causes, and in very opposite states of the blood-vessels, as well as of the system at large. But, *secondly*, that the causes, although various, operate towards the same end, 1st, either by accelerating the circulation of the blood in one part or in the system generally, while it is retarded in other parts, and while one or other of the natural outlets for the serum of the blood is more or less obstructed; as will be the case, for example, when the liver, kidney, lungs, or heart, is the seat of chronic disease; as also, when the function of the skin is suddenly checked, and upon which has supervened a subacute inflammation of one or other of these organs, or it may be of the serous membranes, or some other part of the body—leading, in either case, to farther obstructions, and, at the same time, to general excitement of the circulation: or, 2d, they operate towards the same end, by depressing the vital actions of the system, so as to favour the formation of *passive* congestions; and also, by gradually inducing some alteration in the qualities of the blood itself, whereby, in particular, its watery part is made to predominate over the fibrin and red particles, and a serous or hydropic diathesis established. By the former method are originated inflammatory dropsies—primary as well as consecutive; and by the latter, the passive and asthenic forms of the disease.

Division of Dropsy.—In accordance with what has just been stated, dropsies may be divided, 1st, into the primary or idiopathic; and, 2dly, into the secondary, consecutive, or symptomatic,—the former having no connection with antecedent organic disease, while the latter have. But the cases belonging to the first, as well as to the last of these divisions, may or may not be attended with in-

creased vascular action; and hence, 3dly, dropsies are either active or passive—acute or chronic; the latter terms having more particularly a reference to the rapidity with which the serous fluids are deposited. And in relation to the state of the vital actions of the system generally, the disease may be sthenic or asthenic. *Lastly*, it is local or partial, when the effusions are confined to one cavity or part of the body—the abdomen or cellular tissue of the extremities, for example; and it is a general dropsy, when the common cellular membrane and the serous cavities are the seat of effusion.

Symptoms and Treatment of these Different Orders of Dropsy.—From a slight consideration of the nature and causes of dropsy, it will be obvious that the symptoms and treatment of this class of affections must often vary widely in different instances; and this is true even of cases of dropsy occupying the same locality, seeing that, in one case of ascites, inflammation may be present, and in another a state of complete atony,—and the same with anasarca. No general indications, therefore, can be laid down which would be either sure or practical in their tendency: to be useful they must be special, and derived from a careful investigation of the various causes and conditions of the system, which we have already specified as being in different instances associated with dropsical effusion.

In forming our curative indications, then, we will be led, 1st, to investigate into the probable presence of organic lesions, and into the particular nature and extent of the same; 2d, to determine the existence or non-existence of inflammation, or increased action of the vessels of a part, or of the heart and arteries generally; 3d, to estimate the vigour and integrity of the general constitution of the patient; and, 4th, to ascertain what parts are occupied by the dropsical effusions. Before, however, stating the practice suitable to each form of dropsy, it may be necessary to mention the most prominent points of general treatment;—These are, 1st, To remove or subdue the immediate exciting cause, and which, even in the consecutive dropsies, consists very often in a certain degree of local increased vascular action. For the accomplishment of this purpose, we must employ antiphlogistic measures; but rarely to the extent that would be deemed proper in a case of idiopathic inflammation; and even in the *primary inflammatory* dropsies, considerable moderation will be advisable in regard to general blood-letting. In the *asthenic* or purely passive dropsies, the treatment will, in most particulars, of course, be the opposite of that just recommended. 2d, Having removed, as far as possible, the more immediate exciting cause, it will be necessary to endeavour to assist the natural efforts to remove the dropsical effusions. This is effected by the exhibition of those remedies which excite the action of the absorbents, directly or indirectly; and cause the fluids to be discharged by one or other of the natural emunctories—the kidneys, skin, or intestinal canal.

I. *Primary Dropsies* are rare, compared to those which are

secondary. They make their appearance, for the most part, in young constitutions of plethoric tendency. The patient shows symptoms of pyrexia—the pulse is fuller, and often somewhat harder, and quicker than natural, much thirst is complained of, the tongue is furred, the bowels confined, and there is a hot and dry skin, &c.; while a serous fluid, often somewhat turbid, owing to a slight admixture of albumen or flocculent lymph, is in the course of being deposited in the subcutaneous cellular tissue of the face and upper parts of the body, extending quickly to the trunk and extremities; ending in complete anasarca, and sometimes, also, in dropsy of the different serous cavities. In this acute form of the disease, the urine is for the most part scanty, often very dark-coloured, (owing, it is supposed, to a certain admixture of red globules,) and of low specific gravity; affording, at the same time, on the application of heat or chloride of mercury, a more or less copious deposition of albumen,—derived from a portion of the serum of the blood which has passed through the kidney unaltered.[1] Further, as this sthenic form of dropsy is frequently associated with a certain degree of inflammation of the lungs, more particularly bronchitis; and occasionally, also, with a similar affection of the kidneys, or of the exhalent surfaces themselves, a certain degree of dyspnœa, pectoral oppression, and cough, may be looked for, as well as the symptoms which are noticed in page 79, as indicating irritation, or subacute inflammation of the kidney.

In this form of dropsy, besides the remedies specially directed to the removal of the effused fluids, (namely, diuretics, hydragogues, and sudorifics,) blood-letting, and the other parts of the antiphlogistic treatment, must be strictly pursued; modified according to the degree of vascular excitement, general and local; and according to the nature of the internal complications, the organs affected, and the powers of the constitution. Even should there be no distinct local inflammation present, but only a phlogistic diathesis, or state of general vascular excitement, a full blood-letting will prove

[1] A coagulable, *i. e.* an albuminous, state of the urine, will be found to exist in cases of dropsy, wholly unconnected with any affection of the kidney: it, indeed, very generally accompanies dropsy, from inflammation of the lungs or heart. But although a coagulable urine may, especially when of low specific gravity, be considered as a pretty certain indication of the existence of some degree of inflammation, or congestive irritation of all and each of these organs, it is not by any means a safe guide to practice when viewed by itself; since this state of the urine also occurs in connection with those irremediable organic lesions of the kidney formerly referred to, and with which is associated a cachectic state of the constitution, the consequence of long-existing diseased actions, from indulgence in spirituous liquors, and other habits of a vicious and debilitating tendency—a condition of body ill suited to the loss of blood, or any other kind of depletion.

It may be here, also, remarked, that this state of the urine rarely occurs when the effusions are confined to the abdominal cavity—anasarca being the form of dropsy with which it has hitherto been found most frequently connected

advantageous, if practised early. Along with blood-letting, the compound powder of jalap, or half-grain doses of elaterium, ought to be administered as hydragogues. Should the lungs, however, be more particularly affected, tartrate of antimony, and cupping over the chest, will be first required; and in this case, also, hydragogue medicines must not be too often repeated, more especially when the affection of the lungs has existed a few days. Squill, combined with a little calomel or blue pill, digitalis, and the supertartrate of potass, are the best diuretics in this form of dropsy. But so long as there exists much febrile or inflammatory action, diuretics of every description will fail in their effects. The supertartrate of potass is most suitable for the inflammatory stage, and the squill, digitalis, and calomel, for the after periods of the disease; the digitalis more especially should not be employed until the force of the circulation has been subdued, and the pulse reduced to a very compressible state. Should the serous membranes be the seat of inflammation, blood-letting may be practised both with more freedom and more benefit than in those instances where it is confined to the mucous membrane of the air passages. The dropsy which supervenes on scarlatina is not unfrequently of this description, commencing suddenly after exposure to cold, which had caused obstruction of the cutaneous secretion; but, in other instances, without any such obvious cause—and, in a few cases, partaking so much of the passive form as to forbid the use of the lancet, and restrict the treatment to digitalis and squill, combined with tonics, and small quantities of stimuli. A favourable prognosis may commonly be given in acute idiopathic dropsies, unless where the brain has become the seat of effusion.

II. But primary dropsies are not always accompanied with states of the vascular system such as we have now described. They may proceed from a very opposite condition of the vessels, and of the system generally—*i. e.* they may be purely passive and asthenic, and yet not associated with organic lesion. When such cases occur, they are generally the consequence of the continued operation of those debilitating causes to which allusion was made in page 68. These Idiopathic Asthenic Dropsies are for the most part very chronic—the serous fluids being first extravasated into the cellular tissue of the lower extremities, and only very gradually extending to the upper parts of the body, and to the serous cavities; although, in a few instances where the dropsy succeeds to causes which have suddenly brought about much debility, and especially when the individual is of the leuco-phlegmatic habit of body, it is apt to form more quickly, as well as more extensively—affecting not only the cellular tissue, but invading the different serous cavities, more particularly the abdomen.

In asthenic dropsy, those parts of the cellular membrane which are infiltrated with serous fluid, (*e. g.* the feet and ankles,) will be found to present a colourless and somewhat transparent intumescence, which is very soft and yielding—pitting much on pressure,

and possessing none of the firmness occasionally observable in the acute anasarca, of which we have already spoken; while the general surface of the body is cool and pallid, and the pulse small and very compressible, with other signs of debility.

The treatment applicable to this form of the disease will consist in tonic remedies, with squill and digitalis; to which may be added a little opium, or compound powder of ipecacuan, should the stomach or bowels be in an irritable state, as also a little hydr. cum creta, to correct the alvine secretions, and increase the diuretic effects of the squill and digitalis; carefully, however, watching the operation of the latter remedy, and guarding against its depressing effects, by administering small quantities of wine, brandy, or spirit, ether, nitr.: and even the mild mercurial preparation above-mentioned must be cautiously administered in such cases, so as not to affect the system, but act only in the way of a gentle alterative. The ferrum tartarizatum may be employed often with much advantage in asthenic dropsy, along with infusion of senega, calomba, or decoction of spartium scoparium, more especially when the disease is associated with chlorosis and suppressed uterine function, and when there is a languid circulation. Hydragogues should not be employed in this form of dropsy—purging almost always aggravates the disease; the bowels should only be kept gently open. A mild nourishing diet ought to be allowed; and frictions and bandaging will be highly serviceable.

It is, however, to be borne in mind, that, in asthenic dropsies, the supervention of a low and latent inflammation of the bronchial membrane, or pulmonary parenchyma, or of the serous membranes, or some other part, is by no means infrequent, and which would be aggravated by the exhibition of the more active tonics: occasionally, therefore, a modification of antiphlogistic remedies, such as cupping, leeching, and counter-irritation, will be requisite; giving, at the same time, saline diuretics, as the acetate, the nitrate, or super-tart. of potass. In the event, however, of blisters being applied in such cases—and they are certainly very efficacious remedies, more particularly in the subacute inflammation of serous membranes—they ought not to be continued longer than is sufficient to redden the skin, a succession of warm poultices being afterwards applied to raise the cuticle. And on no account ought they to be applied to parts of the body which are remote from the centre of the circulation, nor to œdematous parts—gangrene being a frequent consequence of the inflammation which is excited by blistering such parts; since their vitality is always much weakened, probably by reason of the constant pressure which is kept up by extravasated fluids on the cutaneous capillaries.

III. Consecutive Dropsies are much more common than the idiopathic dropsies, whether of the sthenic or asthenic kind. They occur most frequently in the later periods of life, and are very commonly of gradual formation, pursuing a chronic course. They are accompanied with a variety of symptoms, indicative of those vis-

ceral lesions (see p. 65, et seq.) which stand in the relation to them of *permanent* predisposing causes; and in consequence whereof the effusions are difficult of removal, and when removed, always very liable to recur. Since, however, the dropsies of the present, like those of the former class, owe their *immediate* origin in many instances to a subacute inflammation—*e. g.* of the pleura, pericardium, or peritoneum, though, perhaps, still oftener to an obscure bronchitis, which has supervened from exposure to cold or other accidental cause—it happens that a cure (but almost always a temporary one) is not unfrequently affected, so far as the dropsy is concerned; while, by a judicious palliative treatment, in other cases where complete success cannot be obtained, life may be considerably prolonged. These remarks are most applicable to dropsy from diseased heart, and least so to dropsy from chronic obstructions of the liver or kidney—the latter being little amenable to medicine of any kind.

Dropsy from Cardiac Disease.—Dropsy which is the consequence of organic lesion of the heart or great vessels, is, for the most part, very gradual in its approaches; but when an inflammation of the lungs, pleura, or pericardium, supervenes upon the chronic affection—a circumstance by no means unfrequent, especially bronchitis—the effusions will take place more suddenly, or, if already present to some extent, will make rapid progress.

Dropsy from diseased heart will generally be observed to occupy, first, the cellular membrane of the face, especially the eyelids, afterwards extending to the rest of the body, as also to the cavity of the thorax and pericardium; although it is probable that, in many cases, some degree of hydrothorax is present at the time that the anasarcous swellings first attract the notice of the practitioner, were he always able to detect the presence of fluid in the chest thus early, and while yet very limited in quantity. The effusion into the pleural cavities will, however, be most marked when pulmonary inflammation involving the pleura has supervened. Ascites occurs only in the advanced stage of the disease; unless some of the abdominal viscera (*e. g.* the kidneys or liver) are at the same time in a diseased state. The other symptoms of cardiac dropsy will be derived from an attentive investigation of the different phenomena which characterise the various organic lesions of the heart and great vessels. These I can only very briefly refer to in this place; yet much of the success of our treatment, as respects the dropsy itself, depends on the correct interpretation of them. Thus, then, should the impulse at the præcordial region be much stronger than natural, while the ventricular sounds are obscure, *hypertrophy* is denoted; and if, along with a strong impulse, the sounds are loud and prolonged, the impulse and the sounds being at the same time perceptible over a much greater extent of surface than usual, *dilatation* as well as *hypertrophy* may be inferred; an inference which will be fully warranted, when—as will commonly be the case, seeing it is most frequently the left ventricle that is the seat of *active*

dilatation—the apex of the heart strikes below the sixth rib. And again, if the impulse be very weak, or altogether imperceptible to the hand or ear of the practitioner, when applied to the præcordia, while the ventricle sounds are unusually loud and sharp (particularly the first sound, or that which is heard during the ventricular systole)—there is much probability that *dilatation* exists *without* hypertrophy, perhaps with thinning of the walls: and if, along with these signs, we perceive the jugular veins to be unusually turgid, and permanently so, it is to be inferred that the *right* ventricle is principally affected. While, lastly, should the pulse at the wrist be small, compared with the heart's impulse, or should there be a tumultuous and irregular action of the heart, several of whose pulsations do not extend to the radial artery, (in which event, of course, the pulse will be intermittent,) there is every reason to conclude that disease of the valves, or of the aorta, or of both, is present; especially when, along with these symptoms, one or other of those sounds are heard, to which recent pathologists have referred, under the names of the *bellows* sound, the *rasping*, and *sawing* sounds. And the diagnosis, in respect to the above lesions, will derive additional confirmation when, upon inquiring into the history of the case, we learn that the accession of one or other of the groups of morbid phenomena to which we have just been adverting, has been gradual; and that they have continued for some time to make a steady though slow progress; or have more quickly succeeded to an attack of pericarditis, or supervened on acute rheumatism, and been little influenced by any mode of treatment which may have been adopted on the supposition that they might only be connected with sympathetic disorder of the heart—dependent, for example, on gastric or uterine irritations. The colour and general aspect of the patient's countenance will also greatly assist us in forming a diagnosis.

The treatment of cardiac dropsy must be conducted with a particular reference, 1st, to the active or passive character of the lesion, *i. e.* with reference to its connection with dilatation and thinning of the walls of the cavities, or, on the contrary, with hypertrophy, simple or combined with dilatation; and 2d, it must be conducted with a reference to any inflammatory or congestive affection of the heart, lungs, pleura, or other organ of the body, which may have supervened on the chronic organic lesion, and have operated as the chief exciting cause of the effusions. Accordingly, should it appear that the dropsy is connected with inflammation of the chest, (*e. g.* the serous covering of the heart, lungs, or pleura,) a general bleeding, followed by cupping or leeching near to the seat of inflammation, will be required. The super-tart. of potass by itself, or combined with jalap, is afterwards to be given, so as to operate freely on the bowels. Should the effused fluid not be entirely removed by these measures, a pill composed of two grains of squill, with a little mercury and extract of taraxicum, may be exhibited every fourth or six hour; giving, in the intervals,

the super-tart. of potass, largely diluted, in doses of half a dram to a dram. And failing any diuretic effect from these remedies, we may try the digitalis, or the colchicum, singly or combined. Such is the treatment most suitable in general to dropsy which has supervened on the more active forms of cardiac disease, in a constitution otherwise healthy—a circumstance by no means rare; persons labouring under *active* aneurism of the heart being, indeed, often remarkably robust.

Should the dropsical effusions, however, supervene on those passive dilatations, or softened and atrophied states of the muscular parietes of the organ, which are characterised by an irregular and feeble performance of its function, leading to passive congestions, a different line of practice must be adopted. And even in the event of inflammation existing—provided it is not acute, and particularly if it be chiefly confined to the mucous membrane of the air passages—general bleeding had better be omitted, and cupping substituted; or, at least, the bleeding should not be carried beyond a very few (six or eight) ounces. But, indeed, when the inflammation has existed for some time—and it very often has, in the form of a chronic bronchitis—and is attended with a copious expectoration, the abstraction of even this small quantity of blood from the general system may prove dangerous, more especially if drawn quickly in the erect posture. For in this way a sudden check is very apt to be given to the large muco-purulent discharge which is taking place from the bronchial membrane; while the weak contractile power of the right ventricle (which is much oftener affected with this species of lesion than the left,) may prove altogether inadequate to support the circulation of the blood through the lungs, and effect its transmission to the left side of the heart. The whole capillary system of the lungs will then become overloaded, and, as a farther consequence, serous effusions will take place into the air cells and pulmonary parenchyma, speedily producing asphyxia. I need hardly remark, that a similar effusion may, under other circumstances, result from an *increased* action—amounting, perhaps, to a subacute inflammation—of the pulmonary vessels.

In this asthenic form of cardiac dropsy, therefore, cupping, leeching, and counter-irritation, will form the most proper and safe remedies against any inflammation which may be present; and squill, combined with a small quantity of opium, or muriate of morphia—or the tinct. of squill combined with spirit. æther. nitr. and a little tinct. of digitalis,—may be employed as diuretics. Moderate allowances of nourishing food, and even of wine, will be required, especially in the cases which are more strictly passive.

I would here take occasion to inculcate on the student caution in the use of the lancet, in all organic affections of the heart, particularly those consisting in, or associated with, passive dilatation of the ventricles. The severe paroxysms of palpitation and dyspnœa, which recur from time to time during the progress of the various organic affections to which we have been referring, are often so

violent and so distressing, that they are apt to suggest to the mind of the practitioner their connection with inflammation; under which impression he naturally resorts to blood-letting. But such symptoms are much more frequently associated with nervous irritation than with inflammatory action; and at all events the degree of the latter cannot be fairly judged of by a comparison with the force of the heart's action, or yet with the pulse at the wrist, which, in the absence of disease of the valves, or other obstruction to the course of the blood along the aorta, is often preternaturally full, tense, and bounding, when no inflammatory excitement prevails. Accordingly, although these violent fits of palpitation, &c. would seem to derive often a temporary alleviation from the abstraction of blood, I am at the same time fully satisfied that, by frequently resorting to such a practice, these same symptoms will in the end be greatly aggravated—the irritability of the system being thereby increased more and more; while it (blood-letting often repeated,) promotes the formation of dropsy, by reducing the blood to a watery state. Local bleeding by cupping is much less objectionable, should any symptoms arise which particularly indicate the abstraction of blood. But in many cases the operation of a cathartic, followed by immersion of the feet in hot water, and a draught composed of ten or fifteen drops of vin. colch., with an equal quantity of tinct. of digitalis, and vin. tart. ant., in a little camphor emulsion—repeated five or six times, at intervals of four hours—will bring about a more quiet action of the heart. At the same time, great attention must be paid to the diet of the patient,—giving him a moderate allowance of solid food of the blandest description, and enjoining him to abstain as much as possible from fluids of every kind; in order that the blood may neither be too serous, nor yet formed so quickly and in such quantity as to prove an overburden to the irritable, and in other respects diseased heart, in the discharge of its functions.

Dropsy from Disease of the Lungs.—The dropsy which originates in the disease of the lungs is much less susceptible of even that temporary cure, which is so often accomplished in that which arises from diseased heart. In several particulars the dropsy now under consideration is like to the last-mentioned. We need only, therefore, remark, that the serous effusions which take place in consequence of tubercular, encephaloid, and other deposits of a *constitutional* kind, are more asthenic than those which succeed to simple inflammatory consolidations of the lungs, and generally make their first appearance in the form of œdema of the feet and ancles. At the same time, we must not forget that a low or very subacute inflammation of the pulmonary parenchyma and bronchial membrane almost invariably accompanies the progress of these lesions; and that, especially in the tubercular disease, pretty smart attacks of pleurisy are apt to supervene. In such cases, cupping and leeching, or even a small bleeding, will be requisite; and so long as the integuments of the chest are free from effusion, counter-

irritation, with repeated small blisters, or with the tart. of antimony ointment, will be very beneficial. Squill, and to which may be added a little opium and balsam of copaiba, will commonly be the safest and best diuretic. Hydragogues are rarely admissible in this form of dropsy; and mercury is by no means so advisable a remedy in this as in the sthenic or acute inflammatory dropsies. As a general rule, indeed, we ought to avoid using mercury to any extent whenever it is known that extensive organic disease exists; more especially when the disease is of the scrofulous character: ptyalism is particularly injurious in such cases. The tonic regimen, with bitter infusions, and also small doses of the ferrum tartarizatum, will be proper in the absence of any decided inflammatory symptoms.

Hepatic Dropsy.—This form of dropsy is very generally chronic. The effused fluid is mostly confined to the peritoneal cavity, and the depending parts of the body; although, in the event of a pretty smart attack of inflammation supervening on the organic affection of the liver, the dropsy may soon become general. It is in most cases difficult of removal; and the same may be affirmed of the dropsy consequent to disease of the spleen, uterus, or ovaries —the effusion partaking more or less of the passive character in all of these cases, and chiefly occupying the cellular tissue of the lower extremities, and cavity of the abdomen. The treatment, accordingly, is only palliative, excepting where the effusions have taken place rather suddenly, owing to an accession of inflammation of the liver, peritoneum, kidney, lungs, or other viscus. Local bleeding, especially by cupping, counter-irritation over the affected part, and a general bleeding, if the symptoms are rather acute, will, together with a free action on the bowels, constitute the proper treatment in these latter cases; bearing, however, in mind, that the asthenic condition of the patient contra-indicates depletion by the lancet to any extent, unless the severity of the symptoms and his immediate safety should appear to call for such a measure. Mercury, along with squill and a little opium, may be afterwards employed; but the exhibition of mercury so as to affect the system can only be useful, provided the organ has yet undergone no decided change of structure. To determine this, however, is always a matter of difficulty; at least the diagnosis is rather founded upon the history of the patient's previous illness, his habits of life, &c. than upon any symptoms which can be considered as pathognomonic. Thus, a high degree of *probability* arises in favour of the existence of organic disease of the liver—a probability which ought to sway our practice in the absence of more positive signs—when dropsical effusions have gradually made their appearance after a long and continued course of severe dyspeptic ailments, and various uneasy sensations, which appeared to be distinctly referable to the above-mentioned organ—in an individual of intemperate habits, especially in respect to drink, who has already passed the meridian of life, and whose whole aspect (*e. g.* emaciated form, pale, doughy,

sallow complexion, dry, harsh skin, &c.) bears proof of a general decay of the vital powers. Mercury given in such a case, to affect the mouth and influence the system, would be almost certain to produce an aggravation, instead of an amelioration, of the dropsical symptoms, as well as of those more immediately associated with the disease of the liver. A solution of iodine, with hydriod. of potass, may be tried in the more chronic cases of hepatic dropsy; but here, also, we must proceed cautiously, lest we over-stimulate and ultimately weaken the system. The following is the best and safest mode of exhibiting this remedy:—One grain of iodine, two of the hydriodate of potass, dissolved in eight ounces of water—of which two table-spoonsful to be taken three times a-day. The ointment of the hydriodate may be at the same time rubbed in over the abdomen and region of the liver. In other cases, again, the colchicum may prove useful. This remedy acts best when combined with a little magnesia or an alkali, such as the carb. of ammonia—to which may be added a little nitrous æther. Tonic and diuretic vegetable infusions, containing a little carbonate of potass, will also be proper remedies in such cases.

Renal Dropsy.—Dropsy from organic disease of the kidney is more variable in its course and symptoms than any of those already spoken of. It is also very generally associated with some inflammatory or congestive affection of the lungs; and as the alterations in the structure of the kidney are not only of similar character in most cases to those of the liver, but induced by similar remote causes, it very often happens that this latter organ is likewise in a diseased state. And, moreover, the peritoneum is not unfrequently the seat of chronic inflammation. Where there is so much complication of disease it necessarily becomes a difficult matter to assign to each lesion its proper share in the production of the effusions; for I believe it is very rare to find the kidney alone in a diseased state—the liver and all other viscera being healthy. In the renal dropsy, the effusions commonly appear first in the form of anasarca of the lower extremities, extending upwards; and, in some cases, affecting the whole cellular tissue, chest, and abdomen, and ending at length in effusion within the head. The general symptoms are, therefore, not unfrequently acute; but the local symptoms, or those referable to the kidney, are often somewhat obscure, and this, even when inflammation has affected the gland. A sense of weight, however, and fulness in the loins, with nausea, vomiting, and occasional tormina, will, when accompanied with a coagulable urine of low specific gravity, afford a pretty certain indication of the renal affection; while, in a considerable proportion of the cases, another set of local symptoms referable to the chest will, if carefully sought for, be found, denoting the existence of pulmonary or cardiac disease. Dropsy from disease of the kidney (with the exception of that which occurs suddenly from exposure to cold after scarlatina, and obstruction of the secretions; and which was stated to be depending simply on congestion or

inflammation, p. 71,) is very generally irremediable, and even sometimes speedily fatal.

The super-tart. of potass will be found to be one of the best diuretics in renal dropsy; and, when any inflammatory action which may have been present, has been subdued by local bleeding, and other anti-phlogistic measures, a combination of squill, digitalis, and opium, or extract of hyosciamus, (as recommended by Dr. Bright,) may be used. Attention must also be directed to the thoracic complications, and the inflammatory affection of the peritoneum, formerly noticed as being frequent concomitants;—counter-irritation, leeching, and cupping, will be the chief measures required for them. The balsams, terebinthinates, essential oils, and other substances which act as powerful and direct stimulants to the kidneys, must be avoided, at least in those cases where there is any reason to suspect the presence of inflammation, and which in some degree is seldom absent. These stimulating diuretics seem to be best adapted to the *primary asthenic* dropsies. Mercury may be, perhaps, a useful adjunct in the acute form of renal dropsy, after depletion has been practised; but where it has supervened on structural lesions, it is contra-indicated by the general debility of the patient. In every case, however, where the kidney is known to be affected, whether it be by organic changes, or by congestive irritation or inflammation, this latter remedy must be cautiously administered, lest it augment the irritation, and so increase the effusions. Before concluding these observations on the treatment of dropsies, I may observe that cases will occasionally occur in which the diuretic medicines will produce so much gastric irritation, that we are obliged to desist from their further exhibition. This is particularly liable to happen in the cases which we last considered, as also in some cases of hepatic dropsy. In order, in some measure, to provide against such an occurrence, M. Guibert (a French physician) has suggested the employment of a diuretic liniment. The following is the formula which he recommends:—Tinct. scillæ, —— digitalis, —— sem. colchici, of each an ounce—and of the ol. camphorat. et ammoniat. of each an ounce and a half. With this liniment, the chest, the abdomen, and extremities, are to be well rubbed twice or thrice a-day. At the same time we ought to endeavour, by leeching, counter-irritation, and other means, to allay the morbid sensibility of the stomach.

Symptoms Diagnostic of the Seat of Dropsy.—Anasarca is readily distinguished by the soft, tumid, pallid state of the common integuments—pitting more or less on pressure. Ascites is made known to us by the uniform elastic swelling of the abdomen, commencing below, and gradually extending upwards; and by the fluctuation of the fluid, which is discoverable on applying one hand to one side of the swelling, while the opposite side is gently struck by the other hand. The diagnosis of hydrothorax is very uncertain, unless where the quantity of fluid is great. Dyspnœa, much increased on lying down; dulness on percussion, particularly near

to the spinal column, and over other dependent parts of the chest; along with suppression of the respiratory murmur—little or no sound being heard, unless what is emitted from the larger bronchiæ, when the stethoscope is applied opposite to the part where they bifurcate—will be the most certain signs of the existence of fluid in the chest. And these signs will be rendered still more certain when they are met with on both sides of the chest, for otherwise it is hardly possible to distinguish it from empyema; which, indeed, is a point in the diagnosis of considerable importance, since paracentesis may be practised in the latter case with a chance of success; but not so in the former. Dropsy of the pericardium is characterised by a feeble variable action of the heart; a soft undulatory pulsation at the præcordia, and increased dulness on percussion; a difficulty in maintaining the horizontal posture, and increase of dyspnœa on attempting to do so; and a diminished intensity of the ventricular sounds. But here, as in hydrothorax, should the quantity of fluid be small (*e. g.* four or five ounces,) a satisfactory diagnosis cannot be established. Lastly, Hydrocephalus is very generally preceded by fever, pain of head, nausea and vomiting, contracted pupil, intolerance of light and sound, &c.—symptoms which are sufficiently indicative of increased action, if not of actual inflammation, within the head; and which sooner or later give place to the usual characteristics of compressed brain, viz. an irregular, slow, and sometimes intermittent pulse, double vision, squinting, amaurosis, dilated pupil, and coma, indicating that effusion has taken place; yet not always so; for softening of the septum lucidum, and other central parts of the brain, may be the only visible effect resulting from the stage of increased action—little or no fluid having been deposited either in the ventricles, or beneath the membranes over the surface of the hemispheres. But, in this case, the softened parts will, I think, be commonly found *infiltrated* with a serous fluid, being, in fact, in a state of œdema.

It is also certain, however, that occasionally a large quantity of serum is met with in the brain, when, during life, no symptoms denoting increased action had been perceived, but where much constitutional debility had prevailed, and especially where the debility had been caused by severe and repeated hemorrhages. The serous effusions in some of these latter instances, therefore, may be considered as resulting from a passive state of the vessels. At the same time, the student ought ever to bear in mind the fact, that even where the general debility is extreme, a local excitement, and that sometimes of a very active kind, *may* be present. Again, in a few other instances of this kind, we can discover that some obstruction to the return of the blood from the head—*e. g.* diseased heart, hepatised or tuberculated lung—has operated as the remote cause of the effusion. Obstructed kidney or liver is also occasionally a cause. (See Dr. Bright's cases.)

These latter forms of hydrocephalic effusion (which taking place sometimes rather suddenly—quickly foliowed by coma—have been

described under the name of "Serous Apoplexy,") will be found to occur oftener in adults, in the decline of life, and in persons who have been exhausted by previous disease, than in children; to whom, on the other hand, the acute hydrocephalus, *i. e.* the true inflammatory affection of the brain, is chiefly confined. I may here, also, observe, that large collections of fluid (three or four ounces,) are frequently found in connection with chronic thickening and opacity of the arachnoid, in the brains of those who have long been the subjects of insanity; and, indeed, may be considered as the most constant of all the morbid appearances met with in the brains of this class of patients—being, indeed, so far as my experience goes, seldom wanting, in a marked degree, in such of them as have been reduced to a state of fatuity (amentia,) before death had occurred.

Over one and all of these cases of cerebral effusion, medical art can, I believe, exert little or no salutary effect; at least, few presume to entertain any expectation of producing absorption of the fluid. We may prevent the effusion—which has been shown to be merely an effect of pre-existing inflammation, or of cerebral congestions, from a retarded or obstructed circulation within the head; but this, we are disposed to think, is all that can be effected.

We may conclude by observing, that the brain is most frequently the subject of inflammatory dropsy; the pleuræ and pericardium rank next in this respect; and the peritoneum last: while the subcutaneous cellular membrane is, perhaps, on an equality with the pleuræ and pericardium.

CHAPTER V.

FEVER.

General Characters and Seat of Fever.—Referring to what was said under the head of "constitutional symptoms of inflammation," (p. 23, et seq.) we observe that the word fever is employed to signify a certain concourse and succession of symptoms, which point out to us that a series of changes is going forward in the functions not of one organ, but of all organs and parts of the body —changes in the vital actions or functions which are *general* over the body, and not *partial;* nor yet necessarily attended with such alteration of the vital actions of a part, as characterises that form of diseased action which we designate inflammation. It is true, indeed, that the French school of Broussais object altogether to the use of the term fever, applying that of inflammation to all those cases of disease which are accompanied with the symptoms which others call fever; alleging that, in he sense in which we have

used it, it is expressive of no definite disease—no positive existence. It cannot be denied that the word taken in its literal meaning is ill chosen, inasmuch as it has a reference to the single symptom of increased heat,—a symptom which, though very generally present, is not invariably so, and, therefore, not an essential character. But may not the very same objection be offered to the use of the word inflammation? Andral appears to have done so, for he employs the word hyperæmia to include all lesions of the circulation, and inflammation amongst the rest. But, in truth, we know as little about the *intimate* nature (proximate cause) of the morbid action in the one case as in the other; and when we employ, therefore, the one term and the other, we do so to express the fact of a certain concourse of phenomena taking place in a definite order of succession. But it is needless to say more on this head. Half the nomenclature of disease might be set aside on Broussais' principle—most of the terms in common use conveying no proper idea of the nature of the morbid action; a circumstance, indeed, which some may regret, but which it would be very difficult to remedy, for various reasons, and particularly because of the uncertain tenure of many of the theories of the present, as of former times.

There is, perhaps, no one symptom which can be said to be constantly present in fever. Neither quickness of pulse, increased heat of skin, thirst, or headach, can be viewed as pathognomonic of it: some of these are met in every case, but no one invariably so. We can only, therefore, determine the existence of fever by observing, that there is more or less disturbance, *first*, of the functions of the brain, and rest of the nervous system—indicated by prostration of strength, and loss of mental energy, &c.; and, *second*, that there is nearly a simultaneous affection of the circulating system, as is evinced by the altered state of the pulse, which is commonly, at first, weak and irregular, afterwards rising in strength and frequency—by an alteration in the temperature of body, and by a marked diminution and vitiation of the whole of the secretions and excretions; and by headach, pain of back and loins, nausea, &c. And we therefore say, that, in every genuine case of fever, there is a morbid condition, the precise nature of which, though unknown, is manifestly co-extensive with the different constituent parts of the body, solid as well as fluid. It is, however, here necessary to observe, that it is not intended to refer certain of the symptoms of fever *exclusively* to the head of deranged nervous action, and certain others of them to that of deranged vascular action. Such classification of the febrile phenomena would be inconsistent with physiology, which teaches us that these two systems are so connected as to be mutually dependent the one on the other, in the ordering of almost every function of the body—secretion, excretion, animal heat, &c. And there seems to be little reason to doubt that, even in the incipient or cold stage of fever, some degree of derangement has taken place in most, if not in all, of the systems and functions; though, assuredly, one set suffers more at one period of the

disease than another. The brain and spinal cord, for example, are more affected in the first instance, than are the heart and arteries, and capillary system of blood-vessels,—the disorder of the latter becoming more prominent always as the fever advances to its second stage.

But although it is presumed that the generality of the practitioners of this country, at least, agree in thinking that an important difference exists between the fever of inflammation, and that to which we assign the term idiopathic—believing that in nature there exists a distinct order of fevers, which in themselves constitute essential or independent diseases—it must nevertheless be remembered, that there are (as already hinted,) several very eminent individuals who do not subscribe to this doctrine; but who maintain that fever is always dependent on some local irritation or inflammation, whose existence is apt to be overlooked by those who maintain the contrary doctrine, and may even in some instances elude the observation of the most diligent inquirer, since it is occasionally of a very subacute nature. According to this view, fever is at once deprived of its essentiality, and placed in the rank of a mere symptomatic or secondary affection.

Without at present detailing the more particular opinions which have been advanced with respect to the nature and seat of fever, it will be sufficient to state, that, amongst those who assign to fever a local seat, differences prevail regarding the particular organ which is primarily affected. Thus, some (Clutterbuck, Marcus, &c.) maintain that the brain is in all cases the seat of affection—others (Broussais, Boisseau, Rayer, &c.) that it is the mucous membrane of the stomach and intestines; while a still greater number conceive that the local inflammation which originates the fever may be situated in any organ or texture of the body—agreeing, however, with the former, so far as to admit that the brain and alimentary mucous membranes are the parts most frequently affected.

Opposed to these views of the solidists, we have those of the fluidists—a sect of the present day who ascribe fevers (more particularly those of the typhoid kind,) to a morbid condition of the blood; and who consider all changes in the solids merely as the consequence of this primary affection of the fluids.[1] That the general mass of blood undergoes a remarkable change in fever, (becoming less coagulable, and of a darker hue,) and that this change is observable at a very early period in some bad forms of the disease —such as the fevers of the East and West Indies, those of the African coast, and of certain districts of North and South America, and even in some of the epidemics of our country—is quite undeniable; and, further, that this altered condition of the blood very materially influences the course of the symptoms, and increases the risk of a fatal termination, is, we think, also certain. But, then, we

[1] See Stevens "on the Blood," and also Dr. Stoker's "Pathological Observations on Continued Fever, &c."

believe that it is a *part* only of that diseased state of the system which we designate fever; the solids, and the nervous system in particular, being—so far as it is possible to trace the order of succession of the different phenomena—as early and as much involved in disease, and perhaps as soon acted upon by the exciting cause, (whether human effluvia, or terrestrial exhalations, or whatever else,) as is the blood by which they are nourished.

But while we do not acquiesce in the doctrine which ascribes every case of fever to an antecedent local action, allied to, or identical with, inflammation, still we would press upon the student the important fact, that some degree of the latter is present in a great majority of the fevers of this as well as of other countries, whereby the severity of the latter is greatly increased. For, while the supervention of inflammation renders the stage of vascular excitement more violent, the subsequent typhoid stage will be proportionably severe and prolonged; and thus the vital powers are in the end reduced to a state of extreme debility, under which the patient is apt to succumb, independently of the structural disorganisations which may have resulted from the local inflammatory actions. And it is also particularly necessary to recollect, that this combination is by no means limited to those cases of the disease which are of the synochoid or inflammatory type; but that it also takes place frequently in the typhoid fevers of this country; and still more frequently in the fevers of tropical regions,—for example, in the bilious remittent and yellow fever of the West Indies.

Without entering into any detail as to the circumstances whereupon is founded the distinction between symptomatic and idiopathic fevers, (in other words, between fevers and inflammations,) it will be sufficient to advert to the following:—1st, That a much greater prostration of muscular strength, and earlier failure of the powers of the circulation—*i. e.* a greater amount of typhoid symptoms—will be observable in the idiopathic fever, than will be found in the fever symptomatic of ordinary inflammation, at corresponding stages of each;—owing, it is presumed, to a powerful sedative cause (contagion, malaria, and, in some instances, a combination of several of the *common* causes of disease operating on a constitution peculiarly predisposed) having been applied to the body, and which, in giving origin to the febrile movements, has acted with much intensity on the nervous system.

2d, That once the fever is fairly formed, *blood-letting* fails to remove it, or materially to shorten its duration, and may even in certain instances be prejudicial; although, assuredly, this measure in other instances (and these form a majority of the cases met with in practice,) is, when *early* and otherwise judiciously employed, well calculated to *lessen* the violence of the disease, by keeping in check the local inflammations which may threaten during the course of the fever, or which may have combined with it from the first; and which, if left wholly uncontrolled, would lead on to consequences destructive of life—such as effusion of serum within

the head, or of mucus into the air passages, ulceration of the intestines, &c.

3d, That in idiopathic fever, there is always a very marked disparity between the symptoms of general functional derangement, *i. e.* between the proper febrile symptoms, and those which are local and characteristic of inflammation—the latter, when present, bearing no ratio to the intensity of the former.

4th, That, in a certain proportion of fatal cases of fever, we are unable to discover, after the most careful inspection of the body, any effusion or other morbid appearance which could be legitimately ascribed to inflammatory action; and that, in the other instances where such morbid appearances are met with, they are far from being so strongly marked as we would naturally expect them to have been, on the supposition of the severe constitutional disturbance being nothing more than *sympathetic* of a local disease. Pus and lymph, for example, are seen but seldom; the effusions are chiefly serous: and although softening and ulceration of the intestinal mucous membrane, and of Peyer's glands in particular, be very common appearances in fatal cases of typhus occurring in France—so common, according to the testimony of certain eminent pathologists belonging to that country, (Louis,[1] Cruveilhier,[2] &c.) as to have led them to conclude that this affection of the follicles (the *dothinentérite* of Bretonneau) forms an *essential* part of typhoid fever, and is, in fact, the primary seat of the disease—we nevertheless do proceed on ample authority when we state, that it is by no means so constant an appearance in the same variety of fevers happening in this country.[3] And, therefore, we think that these, like all the other visceral lesions which have been discovered in the bodies of those dying of fever, are accidental combinations; and that the inflammatory action by which they are preceded and accompanied is always greatly modified by the condition of the system at large, and the altered state of the blood.[4]

[1] Recherches sur la Maladie connue sur le noms de Gastro-Entérite, &c."

[2] "Anatomie Pathologique."

[3] See the works of Barker and Cheyne, Grattan, Percival, Tweedie, Southwood Smith; also, Dr. Alison's valuable account of the fever which was prevalent in Edinburgh during 1826–27, published in the *Edinburgh Medical and Surgical Journal.* As I had the good fortune to be one of the assistants in the clinical wards of the infirmary, and afterwards in the hospital at Queensberry House, during a considerable period of the time embraced in Dr. Alison's report, I had an opportunity of watching closely the cases therein referred to; and as the mortality was great—one in six or seven, and even, for a time, as high as one in four—opportunities for pathological research were occurring frequently. And so far, therefore, as one epidemic goes—as well as from the cases which have fallen under my observation since then, and the reports of others, in different parts of Scotland—I am fully satisfied that the lesion to which we have been referring in the text is much less common in the various districts of this country, than it is reported to be in France, or even in London.

[4] We find that whenever great debility of the general powers of the circulation exists, a disposition to softening and ulceration is manifested in the

4th, Recovery from fever is an occurrence much more frequent than death, even in cases where the symptoms of debility and nervous disorder have been so great, and so alarming, that, had they appeared in a case of what all would agree in considering to be a case of inflammation, a recovery would justly have been declared as hopeless; and, moreover, this often happens when no treatment of any consequence has been employed—none, at least, of a nature calculated to subdue inflammation, supposing it to have been present, and the cause of the constitutional disturbance.

Lastly, the disease to which we assign the term fever differs from inflammation, in appearing (in one or other of its varieties) much more frequently in an *epidemic* form, than any purely inflammatory affection is wont to do.

Nothing is known with respect to the *nature* or proximate cause of fever. We comprehend the disease merely by its effects; and these, as already mentioned, consist in a general derangement of the solids as well as the fluids of the body.

Division of Idiopathic Fever.—Fevers have been divided into the *continued*, the *remittent*, and the *intermittent*, according as the symptoms preserve an uninterrupted course from the commencement to the termination of the disease; or according as they undergo a more or less distinct abatement; or entirely disappear, but recur at regular intervals of some hours. Intermittents and remittents have generally been considered modifications of one disease, arising from *malaria*, or marsh-miasm. And there seems to be the same relation between the remittent and continued forms of fever, as there is between the remittent and the intermittent: that is, a fever assuming either of these forms may be produced by the same agent, acting with more potency at one time than another, and also with more force on one individual constitution than another. It is at least certain, that, in those regions of the earth where malaria is generated in every possible degree of concentration, a fever of the intermittent type will be found in one place, a remittent in another, while in a third station—often distant only a few hundred yards from where the former comparatively mild fevers are prevailing—one of a continued type will be generated,—corresponding to the description given of the worst kind of yellow fever, the Bulam fever of some authors. We are also assured on the high authority of Sydenham, that, in his time, the fevers of this country—which were oftener of the periodical kind then than they are now, in consequence, no doubt, of the different condition of the country as respects culture and drainage—made a transition every now and then from the mild intermittent form to the remittent, and from this

mucous membranes of the body—particularly in those parts which abound in the follicular structure (ileum and cæcum.) and which are at the same time dependent in their position; consequently liable to accumulations of blood. This lesion, for example, is met with in a vast majority of fatal cases of pthisis pulmonalis, even when no tubercles have formed in the mucous membranes—in the follicles—or in the subjacent cellular tissue.

to the continued; apparently just in proportion to the strength of the febrific poison at different seasons of the year.[1] Sir John Pringle makes a similar statement;[2] and Sir James M'Grigor, in his "Medical Sketches, &c." also takes notice of the plague changing its type, losing its continued form, and becoming remittent and even intermittent—a change which was always indicative of an abatement in the severity of the disease. We therefore presume that there is nothing *specifically* different between these several types of fever. As a general fact, however, we may here observe, that continued fevers prevail most in temperate climates, and are in many cases the offspring of *contagion*, or human effluvia; whereas remittent and intermittent fevers are chiefly met with in southern latitudes, where solar heat, conjoined with malarious emanations from the earth's surface, operate together powerfully towards the production of the one or the other.[3]

Much variety is observable, in different seasons, in different situations, in different epidemics, and in different individuals, in respect to the organs which are most liable to become affected with *inflammation* in the course of the fever. For example, in the common fever of this country there is generally more affection of the lungs during winter and spring, than is met with in the fever of summer; while, again, the fever of autumn is most frequently complicated with determinations to the liver and gastro-intestinal mucous membrane—constituting, in this latter case, the *synochus biliosus* of some writers, and the *gastric* fever of others. This difference in regard to the local complications is still more obvious in the fevers of hot climates, compared with those of the colder regions of the earth; for, while intense congestions of the stomach, brain, and liver, are the usual concomitants of the former, bronchial inflammation, or some approach to it, is seldom absent in the latter.

But there is also much variety in regard to the *febrile* symptoms themselves. Thus, the prostration of strength, depression of the heart's action, tremor, subsultus, loose and fluid state of the blood, and tendency to passive hemorrhages, (*i. e.* typhoid symptoms,) will be more remarkable one year than another—during one season of the year, than another—and in different countries, and even in different districts and towns of the same country, compared with

[1] "De Morbis Epidemicis."

[2] "Observations on the Bilious Fevers."

[3] For much valuable information on the etiology, and on other subjects connected with the severer kinds of tropical fevers, see Dr. Johnson "on the Influence of Tropical Climates, &c.;" Dr. Dickson on the causes of Yellow Fever, in the *Edin. Med. and Surg. Journal*, vol. xiii.; and Dr. Wm. Ferguson on the nature and history of Marsh Poison, in the *Edin. Phil. Trans.* vol. ix.—as also the *Medico-Chirurg. Rev.* for 1821. And as our limits will not permit of us entering upon the interesting but much disputed question of contagion as a cause of fever, it may be well for the student to know, that he will derive much information in regard to it from Dr. Alison's paper in the *Edin. Med. and Surg. Journal*, vol. xxviii.; and from one by Dr. Marsh, on the origin of Fever, in the *Dublin Hospital Reports*, vol. iv.

others. These, like the former differences, are mainly owing, no doubt, to the number and intensity of the predisposing and exciting causes; as well as to those peculiar but unknown states of the atmosphere which so materially aid in the propagation of fevers,—hence styled *epidemic* constitutions of the atmosphere.

But, although one fever appears to differ from another only in the intensity with which the respective systems of the body are affected; it must nevertheless be remembered, that the difference in this respect may in some instances be so great as to call for a very material modification of the treatment; nay, even for a mode of treatment nearly the opposite of that which is found to be applicable to the generality of cases, and the generality of epidemics. For example, we may meet with a case in which the nervous disorder may be so great, and the vascular system so overpowered, from the first, as to entitle it fully to the epithet of adynamic—a name which Pinel, and other writers since his time, have assigned to a fever of the lowest type, one whose chief characteristic is prostration of muscular strength, and want of power in the circulating system. And, on the other hand, the vascular actions may so predominate over the nervous, (the latter being comparatively little disturbed,) that the case may correspond nearly to the *synocha* of Dr. Cullen; and, consequently, may require free depletion, while the former requires stimulants. It is not often, however, that we meet with either of these extreme cases in practice; and still seldomer do we find such types prevailing epidemically in this country.

CONTINUED FEVER.

In reference to the preceding remarks, we have now to observe that those cases of continued fever which approach nearest to what was described in page 24, as the concomitant of ordinary inflammation, have been usually described under the name of *Synochus:* in them the action of the heart is most developed, the excitement longest continued, and the typhoid symptoms fewest. On the other hand, those cases in which there is the greatest and earliest display of muscular debility, mental depression, wandering of the intellect, weakness of the heart's action, tremor, and other signs of severe nervous affection, have been comprehended under the denomination of *Typhus.* But as no two cases of fever will be found precisely alike, every shade of variety being met with in practice, it must be obvious that, in many instances, it will be a matter of difficulty to determine to which division—the synochoid or the typhoid—a particular case should be referred. The solution of such a question, however, would, under such circumstances, be attended with no practical benefit; since it is always to be borne in mind that, as these terms are only employed to indicate the most striking

differences in certain of the symptoms, the distinction between a case of synochus and typhus is one of degree, and not of kind. Wherefore, without attempting the refined distinctions of nosology, it is only requisite that the practitioner adopt less of the antiphlogistic treatment, in proportion as the case exhibits less of the synochoid, and more of the typhoid character, and conversely: always, however, recollecting, that local inflammations may complicate a fever of the latter as well as of the former type; and in which event, notwithstanding the symptoms of general debility, a modification of antiphlogistic measures will be required for the time.

Whatever may be the particular type or form of the fever, it will consist, 1st, of a stage of nervous and vascular *oppression;* 2d, of a stage of *reaction*, or of excitement of these systems; and, *lastly*, of a stage of *debility* or collapse. The "Congestive fever" of Dr. Armstrong, Bateman, and others, forms, perhaps, the only exception to this. In the instance to which I now refer, the stage of oppression is so severe—owing, it is presumed, to the powerful sedative effect of the exciting cause, and predisposition of the individual—as wholly and at once to overpower the system; the reaction, if it take place at all, being very slight and imperfect. In most instances of this kind, indeed, the patient never rallies, but lies sunk in a state of stupor approaching to coma, with a feeble pulse, little if at all increased in frequency—a cool dusky skin—dull leaden-coloured countenance—slow laboured breathing—tongue covered with a clammy mucus; altogether presenting a close resemblance to one who has been struck with apoplexy. Tremour and subsultus are absent in such a case; but in one of somewhat less severity, tremours, spasms, vomiting, and other indications of nervous irritation, will be observed. This malignant form of the disease is fortunately in all countries, and at all times, rare; but is oftener met with in unhealthy tropical countries, than in temperate climates. The plague, which is usually considered as a variety of typhus, is understood to be not unfrequently of this severe character, although at other times it is more of the inflammatory type. A case of fever, whether of the synochoid or typhoid variety, may run its course without the presence of local inflammation—without any thing beyond a general functional derangement; and this is what has been styled a *simple* fever. We shall, therefore, shortly describe the symptoms of such a case: but we must again request the student to bear in mind, that a case of simple fever is by no means so common in practice as a fever complicated with inflammation of one or other of the organs of the great cavities, or of two or more of them combined.

Simple Fever.—(1st, *Of the Synochoid Type.*) The symptoms of a simple synochus—"synochus mitior," or common continued fever—are languor, lassitude, and general uneasiness, succeeded by pain in the back and loins, and aching of the limbs, anxious and dejected countenance, chilliness, sometimes rigor, dull headach and vertigo. The pulse at this early stage is weaker than

natural, and generally, also, somewhat irregular; and the respiration short and suspirious: and the patient complains greatly of debility, and exhibits some degree of muscular tremour; most observable in the hands, and in the tongue when protruded—a symptom, however, which is still more characteristic of typhus.

After some hours, or two or three days, these symptoms are succeeded by those which mark the stage of reaction—viz. a pulse fuller and quicker than natural, but soft and compressible—a hot and dry skin, &c.—and by much derangement and suppression of the secretions and excretions, as indicated by thirst, furred tongue, dry skin, anorexia, and constipated bowels. The aching pain in the back and limbs, and general uneasiness and restlessness, are at the same time much increased, as also the vertigo and headach—the former being most felt when the patient assumes the erect posture: and there are often much præcordial oppression, nausea, and vomiting. But, unless inflammation of the brain, or of the lungs, stomach, or other viscus, should supervene, these painful sensations will be moderated as the fever proceeds; for, in the cases of simple fever, all such symptoms, whether referable to the brain, spinal cord, lungs or other viscera, are owing rather to slight congestion of the vessels, and increased sensibility of the nervous system, than to any actual inflammation. The fever being now fully formed, the patient is sleepless, and often somewhat delirious, especially during the night; the tongue becomes dryer and fouler; the stools darker-coloured, and more fetid; the tremour of the hands increases; to which is superadded occasionally slight subsultus tendinum. But this, as well as the delirium, may be absent; at all events it is not an urgent symptom, and only occurs towards the end of the fever. In most instances these symptoms continue, with slight variations, for ten, fifteen, or twenty days, when they gradually remit, and leave the patient convalescent.

This mild synochus seldom proves fatal. Convalescence is usually indicated by the tongue becoming cleaner, moister, and more spongy—the skin cooler, and, at the same time, perspirable—and the pulse slower; whilst the sleep and appetite return.

(2d, *Of the Typhoid Type.*) A case of mild typhus—"typhus mitior"—will be characterised by a similar course of symptoms to the foregoing, only of greater severity; and a few more, referable to deranged nervous function, may be added to the list. Thus, a greater sense of debility—more severe and constant aching in the back and limbs—more general uneasiness and restlessness—more mental oppression—a more dejected and anxious expression of countenance—more vertigo, and greater tendency to syncope, from slight bodily exertions, or from small losses of blood—more complete anorexia—and greater præcordial oppression—will be found characterising the typhus, compared with the synochus, at an equally early period of the disease. While, again, as the fever proceeds, there is greater diminution and vitiation of the secretions, as denoted by the tongue becoming, at a pretty early period, dry,

brown, and contracted—the mouth clammy—the skin peculiarly dry and harsh—the dejections fetid and dark-coloured; at the same time that the whole body of the patient emits a peculiar sickly odour. The pulse is smaller, more compressible, and usually quicker, than in synochus. The heat of skin, also, although often pungent—owing, I suppose, to the complete suppression of the perspiration—is less steady, less diffused, and more easily reduced by exposure to a cool atmosphere, than it would be in a synochoid fever, at the same period after the attack. Irritation of the stomach and intestines, giving rise to much nausea, retching, and vomiting, is also more common and more distressing in typhus, than in synochus. Moreover, there is earlier disturbance of the sensorial functions, as indicated by low muttering incoherency (typhomania,) tremours, and subsultus tendinum—symptoms which are often perceived soon after reaction has begun. At the same time, these nervous symptoms are more persistent than in synochus, and are usually succeeded by some degree of stupor. Finally, there is a greater and earlier disorder of the fluids, as manifested in the imperfect separation of the serum from the fibrin of the blood, and by the appearance of petechiæ, or small spots of blood effused beneath the cuticle; which do not rise above the surface, like the eruptions which characterise the genuine exanthematous fevers, viz. measles, scarlatina, and smallpox. They are, however, often absent in this mild form of typhus. They will be found characterising one epidemic, and not another—the fever of one year, and not the next—even while in all other respects the cases are nearly alike. They usually make their appearance between the third and ninth day. They afford no proof of unusual malignity, unless when they are large and dark-coloured: the *florid* petechiæ, indeed, usually disappear after the bowels have been freely opened, and the patient placed in a cool and well aired apartment; and seem to be owing rather to increased action of the cutaneous capillaries, than to that dissolved state of the blood, and relaxed condition of the vessels, in which we imagine the larger *purple-coloured* petechiæ and vibices to originate.

Diagnosis.—The soft undulatory pulse—moderate degree of headache and vertigo—much general soreness, and muscular depression—tremours of the hands—brownish-white and tremulous tongue—peculiar dejection of countenance—loose, spongy coagulum, exhibited by blood drawn from a vein—and tendency to syncope, when six, eight, or ten ounces have flowed—are the symptoms whereby we may, from a very early period, recognise a case of disease to be one of *idiopathic* fever.

Prognosis.—The prognosis in these milder forms of simple fever is in general good. An abatement in the frequency of the pulse, the dark fur on the tongue beginning to loosen at its tip and edges, and a gentle moisture being diffused over the whole body, should lead us to expect a favourable termination.

Hiccup and difficulty of swallowing are very unfavourable symp-

toms. Involuntary evacuations, and tympanitic distention of the abdomen, are also to be regarded in an unfavourable light, since excessive weakness, or some dangerous oppression of the brain or spinal cord, is to be inferred from the former; while the latter is too often indicative of intestinal ulceration, though it may in some instances be the consequence only of extreme relaxation of the coats of the intestines, or the effects of a system of over-purgation. Tremour, subsultus, floccitatio, and delirium, may, however, be present to a great extent, yet, so long as the pulse remains firm, moderately full, and does not exceed in frequency 120, many patients may recover. When these symptoms, however, persist, and the pulse increases in frequency—rises to 130, and becomes small, unequal, and very compressible; at the same time that the surface is easily chilled on exposure to the air, and the patient becomes insensible to surrounding objects—when roused, again immediately lapsing into a state of stupor; the case may be considered as hopeless.

Treatment of Continued Fever.—In order that unnecessary repetitions may be avoided, we shall lay down the principles which ought to guide our practice in reference to fevers; specifying, as we proceed, the particular line of treatment applicable to each modification of the disease—simple as well as complicated.

1. Since we do not know in what the febrile action essentially consists, but only that it is liable to be complicated with different visceral inflammations, threatening the life of the patient by causing interruption of vital processes—at the same time, that a powerful impression of a sedative kind has been made on the nervous system, and ultimately through it on the whole vital actions—it follows that we must watch every symptom; and, in so far as we are acquainted with the morbid condition which it denotes, apply to it a suitable remedy the moment it assumes a threatening aspect. In no disease more than the present one is it necessary to watch *every* symptom as it arises, nor must we wait until they have developed themselves; on the contrary, it behoves us to be vigilant, and so meet every—the slightest—indication of a local determination to one organ or another, by prompt measures. And the state of the pulse, the skin, and the tongue, must be carefully noted as affording information with regard to the condition of the *general* system—the powers of the circulation and state of the secretions, &c. The various symptoms which are more particularly connected with disorder of the nervous system—for example, the tremours, subsultus, loss of muscular strength, &c.—should also be closely watched; for although medical art can pretend to no great influence over these general symptoms, still there are certain remedies which do to some extent afford relief; in particular, the debility, the pervigilium, and low delirium, occurring in the last stage of the disease, and under which the patient is liable to sink, will not unfrequently be much benefited by the judicious use of stimuli, and

small doses of opium, conjoined with camphor or carbonate of ammonia.

2. The next circumstance requiring particular attention is the stage or duration of the fever; and in order to determine this, we must calculate the period which has elapsed since the first distinct sensation of rigor or chilliness.[1] The age of the patient, his natural powers of constitution, and previous habits of life, are also matters of importance as guides to practice.

3. And lastly, the character of the prevailing epidemic must be carefully noted, since it is a well known fact, and one much insisted on by Sydenham, viz. that the mode of treatment which is proper during one epidemic, or even at one particular period of the same epidemic, will often prove very injurious when applied to another, even although there should be a great similarity between the fevers of the two epidemics in regard to many of their symptoms. For example, in many of the cases of fever occurring at the present time, little blood-letting is required; and the detraction of blood to any great extent is also ill sustained, compared with the fever of 1817–18-19—in which the patients were bled to fifty or sixty ounces, sometimes pretty late in the disease, with decided benefit. (See Welsh on the efficacy of blood-letting in the epidemic of 1817–18.)

As, I believe, it is seldom practicable or safe to attempt, by blood-letting or any other powerful measure, to stop the progress of a fever once formed, we may consider the following as the primary indications of treatment:—1st, To *moderate* the stage of reaction when excessive; and thus obviate the tendency to inflammation of any of the viscera of the three cavities. 2dly, To subdue inflammation when present; or, at least, control it in such a manner as to prevent disorganisations taking place. And, 3dly, To obviate, in the latter stage of the fever, the tendency to death, from exhaustion of the vital powers consequent on the previous excitement. This indication, however, is not in all cases confined to the *last* stage of the disease; in the severer form of typhus, or what has been called adynamic fever, the prostration of strength is at times so alarmingly great, owing apparently to the powerful sedative operation of the morbific cause on the nervous system and organs of circulation, as to render it necessary for us to endeavour to support the system from a pretty early period.

In the fulfilment of the first and second indications, we have recourse to a modified use of the different means composing the

[1] To determine the commencement of a *continued* fever is often difficult, because rigors do not often occur. The patient in most cases only complains of chilliness, and cannot probably recollect when he first complained of it; and in some cases the chilliness continues to be felt for a whole week or longer, before the patient fairly sickens and takes to bed: and in other instances, again, rigors continue to recur even after the hot stage has been fully formed. We must, therefore, make some allowance in our calculations as to the date of the attack, and take other symptoms also into account.

antiphlogistic regimen, viz. the abstraction of all stimuli, external as well as internal, and the administration of cathartics, and in some cases of antimonial and mercurial preparations; together with the abstraction of blood from the general system, or locally, by leeches and cupping—counter-irritants, &c.; while, for the fulfilment of the third indication, it is necessary to have recourse to stimuli of different kinds.

Treatment of Simple Fever.—In the *milder* forms of simple fever which we have just described, all that is required in the way of treatment is, confinement to bed, occasional aperients, and a spare diet. Should the person be of a naturally sound and robust constitution, the abstraction of a few ounces of blood will tend to moderate the reaction, and prevent local determinations taking place. We must, however, be more sparing of the lancet in the typhoid than in the simple synochoid fever, and only use it when required to avert the progress of any threatening symptoms. But in this case the timely application of a dozen or two of leeches will often supersede the necessity of the former measure, and ought to be preferred when the affection is slight, or when the fever is far advanced. Yet, under other circumstances, a general bleeding must be instantly employed, particularly when it is the brain that is affected, and when it is attended with much headache, increase of febrile heat, and a firm and resisting pulse. But to this we shall afterwards advert; in the mean time suffice it to say, that we ought to exercise much moderation in drawing blood from a typhus fever patient; and that having removed a quantity sufficient to produce an impression on the system, we should follow up the advantage by the application of leeches, and trust to them, and to blistering, and other subsidiary measures, for the further reduction of the threatened complication, unless when the symptoms appear more than usually urgent. A very quick and compressible pulse, unsteady heat of surface, and dry, brown, tremulous tongue, are strong contra-indications to general bleeding, even when the delirium and subsultus are very constant. We should also make use of less powerful purgatives in the typhus than in the synochus. In the latter stages, in particular, they ought to be sparingly used; and altogether laid aside, and enemata substituted, when meteorismus and griping begin to appear. It may be necessary to allow a little wine towards the decline of the fever, should the debility be great, the pulse soft and feeble, the skin moderately cool, and the delirium of the low kind, and neither accompanied with much flushing of the face, nor contraction of the pupil. Lastly, cold or tepid sponging should be frequently employed, in order to reduce the febrile heat of the surface; and is always a safe measure, so long as the heat is steady, and above the natural standard.

The SEVERER form of simple typhoid fever has received from different authors different appellations; but the term ADYNAMIC is perhaps the most appropriate, being significant of the marked debility of the vital powers which attends upon such cases from an

early period; as indicated by the remarkable prostration of muscular strength—the small, frequent, and compressible pulse—the moderate heat of surface—the weak and whispering tone of the voice—the great tremours of the hands, lips, tongue, &c.—the great disposition to syncope in the erect posture—the early tendency to low muttering delirium, followed by stupor, and loss of power over the sphincters—the flatulent distention of the abdomen—the weak state of the breathing—the loose coagulation of the blood—the tendency to passive hemorrhage from the skin, (petechiæ and vibices;) in some cases, also, from the mucous membrane of the stomach, (black vomit?) intestines, (melæna,) mouth, and fauces, &c.—besides, the manifest disposition to gangrene and sloughing of those parts of the integuments which are exposed to pressure, or to slight abrasions from the irritation of the natural discharges, *e. g.* of the sacrum and nates—and lastly, by the sunk and cadaverous aspect of the patient.

It was to these latter symptoms that the older authors more particularly referred when they made use of the word *putrescency;* and consequently were in the habit of distinguishing such cases as exhibited these symptoms in the highest degree by the epithet of putrid, malignant, pestilential, and petechial fevers. (Sydenham, Huxham, Mead, Grant, &c.) Huxham, also, referring more to the signs of debility in the nervous system, applied to certain other cases of the disease the epithet of "slow nervous fever." And again, Pringle, Lind, Dr. J. Hunter, and others, describe cases of the disease, which were in many respects similar to the above, under the name of jail, prison, hospital, and ship fever, from the circumstance of its appearing frequently in those places, when ill ventilated and crowded with sick.[1]

There is not a great deal of difference between the adynamic and the congestive typhus of Dr. Armstrong formerly alluded to, only that in the latter the brain and whole system would seem to be more completely and at once overpowered, as indicated by the great stupor and tendency to coma which the patient manifests from the very commencement of the attack,—he is, as it were, in the situation of a person labouring under concussion.

These severer forms of typhus, although by no means unusual in the days of Sydenham, Huxham, Sir John Pringle, &c. have not been much seen of late years. A case only now and then occurs in a person who has suffered much from debilitating causes—*e. g.*

[1] It may be here, however, proper to observe, that these older authors were not particular in distinguishing between simple and complicated fevers; consequently, they included under the name of the low nervous—the putrid—malignant—pestilential—hospital—and jail fevers, not only the severer kinds of simple typhus, but also such as were combined with cerebral and abdominal inflammations. This may be gathered from the list of symptoms which they give. But Sir John Pringle's dissections prove it; for effusions of serum into the ventricles, and even abscess of the brain, were seen by him in several instances.

great bodily fatigue, an insufficient and unwholesome diet, cold, night-watching, mental depression, &c.—and who, from deficient energy of constitution, has been unable to bear up under the powerful depressing effects of the contagion to which he has been exposed, and consequently unable to establish a proper reaction.[1] The poor, therefore, who are ill nourished, ill clothed, and ill lodged, will be more liable to suffer from such fevers, than the higher classes.

Treatment of the Adynamic Fever.—This is the form of fever which derives most benefit from wine, when properly administered; and in some instances it may be necessary to have recourse to it at a very early stage of the disease, to prevent the sinking of the powers of the circulation. The prognosis in such cases, however, is always unfavourable; for we are not to forget that, even under the fearful state of depression to which the patient is reduced by the malignity of the fever, local inflammations may spring up, particularly in the intestines, and call for antiphlogistic measures. Blood-letting, however, is often inadmissible; and when the inflammatory affection supervenes late in the disease, leeching is certainly all that can be ventured upon, followed by hot fomentations, &c. It may even be necessary, in order to prevent the patient from sinking, to have recourse to wine immediately after the bleeding or leeching has been practised. The carbonate of ammonia is a useful remedy in this case. It is one of the safest of stimulants; and, when combined with a carminative, (℞ carb. ammon. gr. xxiv. aq. cinnamon. ℥ vii. tinct. card. c. ℥ ss.—cochl. magn. q. 2da. hora.) greatly relieves the tympanitic distention of the stomach and bowels. As the colon appears to suffer much from this cause, an occasional emollient injection, containing a little ol. terebinthinæ, or tinct. assafœtidæ, will be found useful. The mildest laxatives should be administered, and must not be too often repeated, since there unquestionably exists in all *typhoid* fevers a marked propensity to intestinal irritation, going on to ulceration of the mucous follicles, and which will be aggravated by repeated purgings: besides, the debility of the patient must be greatly augmented, by persisting from day to day in such a practice. Emollient enemata, aided by occasional small doses of castor oil, (two or three drams,) will in general answer to keep the bowels regular, after they have been once freely opened at the beginning of the fever; or a powder may be given at bed time, consisting of two or three grains of hydr. cum creta, and three or four of rhubarb. But should the slightest diarrhœa appear, the rhubarb must be withdrawn, and compound powder of ipecacuan substituted. We ought to make the strictest inquiry into the appearance of the dejections; and the instant they betray an ochery, or bloody, or even a thin and watery

[1] Although contagion is assuredly the most frequent exciting cause of such fevers, I do not at all doubt but they may occasionally be induced by other causes, particularly the impure air of crowded dwellings, filth, and poverty—*i. e.* a combination of the predisposing causes may become the exciting cause.

appearance, leeching must be had recourse to, and all purgative medicines suspended; giving the patient nothing but thin gruel, sago, or arrow-root, to drink.

In the severe cases of typhus, (as just characterised,) few or no *post mortem* appearances are discoverable which can be ascribed with justice to inflammation. It is true, indeed, that there is commonly much turgescence of the venous system, and that the more vascular structures of the body often exhibit much softening. But these appearances seem to be owing to the weakened state of the circulation, and the transudation of the preternaturally fluid blood through the coats of the distended veins. From the same cause the mucous membranes are often deeply ecchymosed; and, from the large quantity of black blood which has escaped into the substance of the lungs, liver, spleen, &c. these organs are often reduced—especially the spleen—to a gelatinous consistency, so as to resemble in colour gangrenous parts, and might be mistaken for such, were we not to remark the absence of the fetor, and other characteristics of this latter state. The congestion, therefore, (which, be it observed, is confined chiefly to the veins, and to the dependent parts of organs,) is to be viewed as a consequence and not a cause of the depressed state of the heart's action, as some conceive it to be; and is consequently a condition not to be safely nor effectually remedied by blood-letting, which, it would be reasonable to suppose, might be the case were the latter supposition the correct one.

Blood-letting has, however, been recommended by practitioners of eminence even in the severest form of fever, viz. the congestive. But we have the authority of many experienced individuals for saying, that it is seldom effectual in removing the alarming symptoms of oppression: the blood, indeed, will often not flow after a vein has been opened. At the same time, all those who have practised, as well as advocated the measure, allow that it requires to be done with the greatest caution, and that the quantity to be abstracted should seldom exceed eight or ten ounces; while after the lapse of a day or two—and, in the *congestive* variety of yellow fever and plague, after a very few hours only—it becomes altogether inadmissible.[1] Local bleeding by two or three dozen of leeches would seem to be a less hazardous practice—applying them to those parts where, from the symptoms, there was reason to suspect the greatest congestion to exist, *e. g.* the head and epigastrium; employing, at the same time, hot fomentations to the extremities, friction to the trunk of the body, and cautiously endeavouring to rouse the action of the heart by small quantities of stimuli; also by the administration of purgative enemata, and a full dose of calomel, followed by castor oil.

[1] The necessity of free depletion by the lancet, in the more ordinary *endemial* fevers of hot climates, cannot be questioned; for they are undoubtedly of a highly inflammatory type—making a near approach to Cullen's *Synocha*, and to the *Causus* or febris ardens of Hippocrates.

Swellings and suppurations of the lymphatic glands of the neck, groin, and arm-pits, occasionally take place in the course of those malignant cases of typhus, as also erysipelas, running sometimes quickly into gangrene. But these swellings of the glands do not mark a crisis, as they do in the plague.

Another severe modification of typhoid fever, bearing a close resemblance to a case of delirium tremens, has been referred to by various authors, under the title of the *ataxic*, *brain*, and *nervous* fever. In this case, a high degree of nervous excitement appears to co-exist with much debility of the circulating system. It is consequently characterised by early, constant, and sometimes high delirium: the tremour and subsultus tendinum are also urgent symptoms; and there are constant pervigilium, and extreme restlessness. The pulse is commonly small, rapid, and compressible, the countenance somewhat flushed, and the eye injected. In the opinion of many, such a case ought not to be ranked as a *simple* fever. And I do think there is every reason to apprehend the presence of some degree of inflammation of the brain or its membranes when such a train of symptoms is presented, more especially when the pupil is contracted and the eye intolerant of light.

The treatment, therefore, of such a case, when seen early, should be commenced by a general bleeding, carefully watching the effects produced upon the pulse as the blood flows. But this must not be hazarded at a later period of the disease—when the pulse has lost its firmness, and the skin its warmth—leeching, together with repeated small doses of purgatives, will be then alone proper. Cold assiduously applied to the head, and hot fomentations to the extremities, will prove at all times powerful auxiliaries; and a blister may be applied to the scalp when stupor threatens. Opiates are contra-indicated so long as the delirium continues high; but when the excitement has been somewhat subdued, by the laxatives, cold lotions, leeching, &c. and no tendency to coma is observable, a draught of liq. op. sed. or sol. mur. morph. will not unfrequently afford much relief, by procuring rest to the patient, and an abatement of the tremour and subsultus. In exhibiting opium in fever, it is always best to give a medium dose, (say twenty or twenty-five drops of either of the foregoing preparations, with five or six grains of camphor, in almond emulsion,) and repeat this draught in a couple of hours if no effect be produced. We incur the risk of inducing coma by giving too large a dose at once. Wine will also be necessary, in proportion as the strength of the patient declines with the progress of the disease. And I am satisfied that it may often be given with benefit, even although the eye continues loaded and suffused, and the cheeks flushed, especially when the flushing is circumscribed—provided the pulse be not sharp, but, on the contrary, soft and feeble, and the heat of the skin moderate, and the delirium of the low and subdued kind. In such a case, however, we must be very careful to keep the bowels open, by enemata, and repeated small doses of castor oil; and to maintain the heat of the

extremities by hot fomentations, and keep the head cool. The effects of the stimulant, however, must in all cases be closely watched; and any increase of delirium, pervigilum, and restlessness, or augmentation of the heat and dryness of the skin, and fauces, must be received as proofs of its disagreement with the patient—when it must either be intermitted, or diminished in quantity and strength.

The excessive tremour of the whole body—the breathless agitation of the patient—the peculiarity of the delirium—the profuse perspirations—the comparatively little derangement of the secretions—and little diminution of muscular strength—will be sufficient, in the absence of other information, to prevent us from confounding a case of *delirium tremens* with a case of fever of the above description.

Complicated Fever.—A simple case of fever, whether of the synochoid or typhoid form, may, during any part of its course, become complicated with inflammation, while in a few instances, such complication may exist from the first. In either case, the inflammatory action is for the most part subacute; at least, it is always so modified as to be productive of much fewer and slighter local symptoms than it is usual to find characterising the primary phlegmasiæ; and, in the severe forms of typhus, the inflammation may be altogether *latent*. There are few textures of the body which have not in some case of fever or another been found in a state of disease. The brain, however, and its membranes, the mucous lining of the air passages, and the mucous membrane of the intestinal canal, are the parts which suffer most frequently.

I. *Head Complication.*—The brain in this country is most frequently affected with inflammation in fever, and the intestines in France. This complication, however, is unquestionably more prevalent at one time than another, and during one epidemic than another. The cerebral affection may be so severe as to be the chief cause of death; in which event the patient lapses into a state of coma, while as yet the circulation is tolerably perfect. It is, however, rare to find this organ alone affected; and in a large proportion of cases, the inflammation of the brain, or its membranes, constitutes only part of the danger—other organs being at the same time inflamed.

A preternaturally injected state of the vessels of the pia mater, and an effusion of serous fluid beneath the arachnoid, and into the ventricles, varying from three or four drams to an ounce or ounce and half, are by far the most frequent appearances discovered after death from cerebral fever. The arachnoid is occasionally opaque, but rarely thickened. The vessels ramifying through the brain, are also in many cases found more turgid than natural, as proved by sections of it presenting a greater number of bloody points than usual. The whole cerebral mass is sometimes observed to be much softened, arising, it is presumed, from the large quantity of blood that it contains, and from the infiltration of serum. It is rare,

however, that we meet with those *circumscribed* ramollissements —*e. g.* of the cortical substance of the convolutions, or parts forming the ventricles, fornix, septum lucidum, &c.—which are so often discovered after primary inflammations of the organ. Induration I believe to be equally rare. Dr. Percival states, that both the arterial and venous systems of the brain were much congested in the cases he examined—a number of bloody points appearing on its divided surface; but he met with none of those severe lesions—abscess, effusion of lymph, blood, &c.—alluded to by Pringle and others as not uncommon after fever. But it may be here observed, that the cases in which Pringle found abscess of the brain were unusually protracted; and in some of them, at least, it may be doubted whether such very marked inflammatory effusions did take place during the febrile state.

Symptoms.—The brain itself may be the seat of the inflammation, or its meninges. But it is likely that, in most cases, both are affected; at least there are no very certain symptoms whereby we can distinguish inflammation of the one from that of the other: pain is probably more felt when it is confined to the membranes, and dull weight or vertigo when it is situated in the encephalon. A certain degree of vertigo, however, as also of headache, would seem to be essential to fever of the mildest description, in its early stage at least. It is only, therefore, when the pain of head and vertigo do not abate after the first two or three days, but, on the contrary, increase and become constant, and especially when these symptoms are much complained of, even while the patient lies perfectly quiet with the head on the pillow, that we have reason to suspect the presence of cerebral inflammation—particularly so when the pain of the head is accompanied with a feeling of tension, weight, or fulness; and when the pulse, losing its soft undulatory feel, becomes either full and hard, or small and sharp. Suffusion and glistening of the eyes—contraction of the pupil—flushing of the face—increased dryness of the tongue—intolerance of light and sound—tinnitus aurium—pervigilium—and a delirium, consisting rather in noisy talkativeness, than in low muttering and moaning, and the other symptoms, which denote cerebral complication.

When the pain of the head, and other symptoms just narrated, are severe, and are allowed to proceed unchecked for a day or two, they will, in all likelihood, be succeeded by dilated pupil, involuntary dejections, and stupor—the patient being with difficulty roused, and in some instances insensible to the stimulus of light and sound. When such is the event, a recovery may be considered as nearly hopeless: since effusion has, in all probability, taken place. I may here remark, however, that, deafness occurring early in fever, unaccompanied with any of the symptoms of oppressed brain, to which allusion has just been made, is generally accounted a favourable symptom.

Treatment.—Blood-letting is found to be more generally appli-

cable to cerebral fever than to any other; perhaps because in the chest and abdomen it is a mucous membrane that is most frequently the seat of inflammation--a structure which is comparatively little benefited by general blood-letting, even when it is the seat of a primary inflammation--(see p. 49.) Bleeding, however, in order to do good, must be resorted to on the instant any of the above threatening symptoms appear; and so long as much pain is felt in the head, and the pulse, instead of being small and rapid, is firm--somewhat full and resisting, and not exceeding 100 or 110--it may be practised with every probability of success. If the fever be not far advanced, the bleeding may be repeated, even to the third time, but in general it will be safer and fully as advantageous to apply leeches, or the cupping glasses, after the first or second bleeding. Cold evaporating lotions must be kept constantly applied to the shaved scalp, and a stream of cold water may be from time to time poured upon it, from a moderate elevation, should the delirium be great, and the heat of the skin and other symptoms of excitement high in proportion. Purgatives and hot fomentations to the legs, are the other remedies most useful in such a case; and tartrate of antimony may also do good when it does not excite too much vomiting.

It is necessary, however, to be cautious in using the lancet at a later period of the disease; and unless there be distinct *pain* of the head, and a tolerably firm pulse, and steady heat of surface, leeching will be more beneficial than venesection. I may here just observe, that a low muttering incoherence--dull stupid expression of the countenance--feeble and rapid pulse--cool skin and tremulous tongue, with or without subsultus, are symptoms connected with a state of the brain which is most likely to derive benefit from small doses of wine, gentle laxatives, hot fomentations to the legs, and blisters to the scalp. For, in this case, there is reason to suppose that the circulation of the blood through the brain is *retarded*, and that, consequently, there is an undue accumulation of it in the venous system, resulting from the great debility under which the heart and arteries are labouring, after a period of excitement.

II. *Abdominal Complication.*--Of the abdominal viscera, the liver and stomach are perhaps most frequently affected in the fevers of hot climates, and the intestines in those at present under consideration. For neither Louis nor Andral agree with Broussais in considering the stomach as a frequent seat of disease in the common continued fevers of France. Traces of inflammatory action were discoverable in this viscus in only about one tenth of the cases examined by them; and we may safely affirm that in our own country they are still less frequently observed. The inflammatory affection is chiefly confined to the *mucous* coat of the intestines, which, in consequence, undergoes certain changes of structure discernible on examination after death, viz.--increased vascularity, tumefaction, thickening, softening, and ulceration. The extent of surface thus affected, will be found to vary somewhat in different

cases, but very often it is limited to the lower third of the ilium; and even this portion of the membrane is rarely diseased throughout. For the most part, we only find patches of it, of irregular shapes and sizes, in the various stages of reddening, softening, attenuation, and ulceration; whilst other portions of it, which have become thickened and swollen, may be observed to be slightly raised above the sound intervening portions. In other cases, again, a considerable number of pustular-like elevations may be discovered occupying the situation of the mucous glands—consisting in an enlargement of these bodies, and constituting the first stage of the dothin-enterite of Bretonnean, formerly referred to (p. 86)—the internal exanthem of other writers. It would seem, however, that these pustular-looking bodies do occasionally originate in the membrane itself, and not in the follicles: and it has likewise been remarked that small depositions of albumen sometimes takes place, to which ulcers quickly succeed,—resembling, in this respect, the aphthæ, which form in the mouth and fauces in some bad cases of fever. (Andral's Clinique Medicale.)

Next to the ilium, ulcerations and other morbid appearances have been met with most frequently in the cæcum, and commencement of the colon, and least frequently in the duodenum and jejunum. The mesenteric glands are often found enlarged and sometimes softened, and even in a state of suppuration. It is probable that the inflammatory action, in not a few instances, is propagated from the mucous membrane along the lacteals to these latter organs, as happens in the intestinal affections of children—in the advanced stage of the "febris infantum remittens." The liver seldom presents any thing beyond venous turgescence, in the fevers of this country; and the peritoneum is not often affected. The spleen is very generally softened, but rarely exhibits unequivocal traces of inflammation.

Symptoms.—There are few symptoms by which to judge of the presence of abdominal complication. Tenderness will be elicited when *firm* pressure is applied to the abdomen, yet not always,—as the sensations of the patient may be much blunted by a cotemporaneous inflammation, or congestion of the brain. Nausea and vomiting are marked symptoms in some cases, but may nevertheless be present to a great extent without inflammation;—they may, for instance, be entirely sympathetic of cerebral irritation, as is exemplified in the early stage of hydrocephalus; or they may be connected with a highly irritable state of the nerves of the stomach —or, to speak more properly, with a morbidly increased sensibility of the organ. Loose stools, redness of the tongue, especially at the tip and edges, and tympanitic distention, will be found, in a good many instances, to accompany the progress of the intestinal affection; and when it is the large gut that is affected, scanty bloody or mucous stools, tenesmus, and the other symptoms of dysentery, may be looked for: the dysenteric affection, however, is more common in the intermittents and remittents of warm climates, than

in fevers of this country. Dr. Bright considers diarrhœa to be one of the most certain symptoms of inflammation of the intestinal mucous membrane; and fluid stools, of a yellow-ochery colour, he considers as indicative of incipient ulceration of the membrane, or its follicles.

Treatment.—Since the pulse then often furnishes no indication of the abdominal complication, so long as the inflammation is confined to the mucous membrane, and since we cannot trust in every case to the tongue, as affording an indication of gastro-enteritis, nor yet to the symptom of pain or tenderness, it becomes necessary in the absence of any very positive signs denoting the presence of this dangerous and insidious complication—while still in its early and remediable stage—that we act upon the *probability* of its existence. And, therefore, in the event of the stools becoming thin and watery, and attended with tormina, I would recommend that a dozen or two of leeches be instantly applied to the right iliac region, or around the umbilicus, followed by fomentations, and a small blister —not allowing it, however, to remain on too long. The leeches may be repeated again and again if the symptoms persist. It will be proper, however, to premise a moderate general bleeding, should the pulse be tolerably firm, the fever not far advanced, and the abdomen distinctly tender to the touch. At the same time, we would, in the present case, caution the student against the too free use of the lancet. A second general bleeding, indeed, seldom proves beneficial, unless when the serous membrane is inflamed. But, indeed, it may be laid down as a general rule that so long as the pulse is soft and compressible (and very generally it is so from first to last in inflammation of the intestinal mucous membrane,) little benefit will accrue from bleeding; leeching is the proper remedy in such a case.

In further prosecution of the treatment, all purgative medicines must be intermitted; and a powder, consisting of three or four grains of pulv. ipecacuan. comp. and two or three of hydrarg. cum. creta, or pulv. cretæ comp. may be substituted;—taking care, however, to avoid constipation, by giving occasionally, when necessary, two, or at most, three drams of castor oil. A pill, composed of acetate of lead and opium, will also prove a valuable remedy, particularly when the diarrhœa is troublesome, and ulceration is threatening. And here, again, we must take care that the discharges from the mucous membrane are not too suddenly suppressed by the remedy. It will be best to commence with a small dose—for example, a grain of the acetate, and a quarter of a grain of opium. The combination of lead and opium is also likely to prove useful—more so we think than any other remedy—in the case where a patient is attacked with melæna—always, indeed, a very unfavourable symptom. Some recommend, for this symptom, small doses of the ol. terebinthinæ. I have no experience of its effects, but of the efficacy of the former remedy I can speak with some confidence, having witnessed its beneficial effects in more

than one case of severity. When much tenderness is elicited by *slight* pressure, we may conclude that the inflammation has extended to the serous membrane; in which case more vigorous measures will be necessary, in order to save the patient. Sometimes the peritonitis is the consequence of perforation of the intestines by ulceration, which has commenced in the mucous coat. Such an occurrence is usually denoted by the *suddenness* of the attack—as characterised by exquisite pain and tenderness of the whole abdomen—a remarkable sinking of the powers of the circulation—the pulse becoming extremely rapid, and the countenance sunk and hippocratic: more especially is this accident indicated when these symptoms have succeeded to diarrhœa, and other circumstances marking a previous affection of the mucous coat. As this distressing occurrence commonly happens late in the disease, general bleeding will often be inadmissible—leeches must then be freely applied to the most tender parts of the abdomen, followed by fomentations with warm ol. terebinthinæ, and a full dose of opium. But it is rare, indeed, that the patient is saved by these or any other remedies.

When there is much irritation of the stomach, with constant nausea and vomiting, it will be necessary to apply leeches to the epigastrium, followed by a sinapism, or a blister. Small quantities of the effervescent mixture may also be useful at times, in allaying this distressing and alarming symptom; while, in other instances, a little magnesia, with a few drops of tincture of opium and aromatic spirit of ammonia, will answer better. Soda water, and a few drops of brandy, will, in other cases, succeed, when every other thing has failed: and may be given with a fourth or half grain of solid opium. These different remedies should be persevered in, even although they be at first rejected by the stomach. But, when there are reasons for thinking that the irritation is sympathetic of inflammation of the brain, it will be necessary to apply leeches to the head, and fomentations to the extremities, &c.—in other words, to attempt to subdue this, the primary affection.

Chest Complication.—This is most common during winter and spring, and it is chiefly the bronchial mucous membrane that is affected. Vascular reddening and thickening of this membrane are consequently the morbid appearances most usually met with in the chest after death from fever; and as a further consequence of the inflammatory action, its surface becomes coated with a tenacious mucus, or muco-purulent fluid. Sometimes the bronchiæ are filled with a bloody mucus; this is more particularly the case when the inflammation has penetrated to the air cells. In other instances, again, where the pulmonary parenchyma has been involved in inflammation, softening and condensation (engorgement) are produced; owing to the effusion of a bloody serum into its cellular tissue. And, occasionally, though more rarely, lymph is deposited; in which case the lung is much firmer than natural—does not crepitate when cut or pressed between the fingers—is friable—and

exhibits the granular appearance, which is considered by Laennec to be the proper anatomical character of lung in the second stage of inflammation, *i. e.* hepatised.

Symptoms.—When the bronchitis supervenes on typhus, late in the disease, it is apt to be overlooked, in consequence of the absence of cough and expectoration, or of any very marked change in the state of the breathing; in other words, the bronchial affection is under such circumstances very apt to be latent. It can only, then, be detected by auscultation and percussion; and even these may fail us, since from the great muscular debility under which the patient labours, the quantity of air that is inhaled may not be sufficient to distend the air cells, so as to elicit sounds audible to the ear of the stethoscopist. Pain is seldom complained of, unless when the inflammation affects the pleura, which happens but seldom. A sense of oppression and constriction, with more or less of dyspnœa and cough, are the symptoms commonly observed, and most to be relied on. At the same time, the natural respiratory murmur may either be discovered to be altogether absent in particular parts of the chest—as when the pulmonary parenchyma is affected; or it may be greatly obscured by the *catarrhal* rales, (otherwise styled sonorous and mucous rales,) caused by the thickening of the bronchial membrane, and the increased effusion of mucus upon it. Dulness on percussion is observed when the pulmonary structure has been condensed by effusions of lymph, blood, or serum; percussion, however, affords no indication of bronchitis. Whether the complication be of the nature of bronchitis or peripneumony, the low delirium, and tendency to stupor, are sure to be augmented in proportion as the affection gains ground, in consequence of the blood sent to the brain being very imperfectly arterialised. This effect of the pulmonary effusions will be indicated by the face, and particularly the lips, becoming livid, while the breathing becomes more and more laborious, and the heat of surface rapidly declines. The pulse, in chest complication, for the most part remains soft and compressible, excepting when the pleura is affected. It, however, usually increases in frequency in proportion as the disease advances; and when the dyspnœa becomes very great, it becomes irregular, and sometimes intermittent. And as the patient in fever, with chest affection, generally lies with his mouth somewhat open, because of the difficult state of the respiration, the tongue necessarily becomes much parched, shrivelled, and encrusted with a thick dark fur. Such, then, are the symptoms, and the following is the treatment of the chest affection:—

Treatment.—If the bronchitis be mild, it will only be necessary to apply a few leeches to the upper part of the sternum, and to administer some demulcent and expectorant mixture, containing a little hyoscyamus, or tinct. op. camphor. In the more severe cases, and particularly when there is reason to suspect inflammation of the substance of the lung, a general bleeding will be required; but in a majority of cases cupping will be equally advantageous: and

the cupping or leeching may be repeated when it would be unsafe to venture upon the general abstraction of blood. The local bleeding may be followed by a blister, and tartrate of antimony may be given in cases where the intestines are free from disease; but when the contrary is the case, the vin. ipecacuanæ should be substituted; a little of the tincture of squill, and also a few drops of the liq. op. may be added, if the cough be very troublesome. In the event of the debility increasing, at the same time that the secretion of mucus is very abundant, and the powers of the patient inadequate to its expulsion, a mixture containing a few grains of the carbonate of ammonia may be advantageously given; and under these circumstances it may even be necessary to allow a small quantity of wine, notwithstanding that some degree of congestion or inflammation may still be present.

PERIODICAL FEVERS.

Intermittent and remittent fevers are chiefly met with in warm climates, because the two agents most influential in producing them exist there in the greatest intensity—namely, solar heat and marsh-miasm, or malaria. The fevers which arise from malaria, in England, Holland, and other countries of northern Europe, are generally of the intermittent type; but in the tropical and tropicoid regions they are more apt to assume the remittent form.

I. Of Intermittent Fever.—Intermittent fevers are now so rarely met with in this country, and are in general of so mild a character—requiring seldom any treatment beyond a few doses of sulphate of quinine—that it will be unnecessary to consider them at any length in the present outline. In the more southern parts of Europe, however, they occasionally assume a high degree of severity; becoming complicated with inflammation of the brain, stomach, and intestines—giving rise to delirium, diarrhœa, dysentery, &c.—and requiring for their successful treatment a modification of antiphlogistic measures. While, again, in other instances, they put on the congestive character,—marked by early stupor, oppressed breathing, convulsions, and sometimes syncope. The cold stage in such instances is greatly protracted, and the reaction feeble. These have been styled *malignant intermittents*, corresponding to the "Intermittentes Pernicieuses" of Bailly, who gives a faithful description of the fever as it prevails in Italy.[1]

General Characters of Intermittent Fever.—A case of intermittent fever is distinguished by its having three successive and distinct stages, viz. a cold, a hot, and a sweating stage—the three

[1] See "Traité Anatomico-Pathologique des Fièvres Intermittentes, Simples et Pernicieuses."

together constituting a fit of ague. According as these paroxysms recur every day, every second, or every third day—*i. e.* at intervals of twenty-four, forty-eight, or seventy-two hours—the case has been denominated, respectively, a *quotidian*, a *tertian*, and a *quartan* ague. The quotidian is usual characterised by a longer paroxysm than the tertian; and it is more apt than the others to lapse into a fever of the remittent type. The tertian is the most common form of intermittent, and also the most curable: it has for the most part a longer paroxysm than the quartan, and shorter than the quotidian. The quartan is the least frequent form of ague; and is perhaps the most difficult to cure. The cold stage of a quartan ague is of longer duration than the same stage in either of the others: the quotidian has generally the shortest cold, and the longest hot stage. Besides these, there are certain irregular forms of the disease, called double and triple tertians, double and triple quartans, erratic agues, &c. There are also what have been termed *masked intermittents;* under which denomination is included a great variety of inflammatory and nervous affections, supposed to be traceable to malaria as a cause; at the same time that they are characterised by regular paroxysms and intermissions, unattended by any distinct symptoms of fever. Ophthalmia, otitis, odontalgia, cephalalgia, asthma, hemiplegia, amaurosis, and aphonia, may be specified as not unfrequent forms of masked intermittents; but the pure neuralgiæ are certainly the most common; and on the whole, perhaps, the facial and sciatic nerves have been found oftenest affected in this way. Moreover, as already intimated, ague may assume different degrees of intensity: thus, it may be a *simple* fever—no one organ being apparently more affected than another; while in other instances, one or more of the internal organs of the body may be suffering from local inflammations, or severe congestions of blood. We shall first notice simple ague.

Simple Intermittent Fever.—The paroxysm of the tertian ague commonly begins at noon, of quotidian in the morning, and of quartan in the afternoon. In either case the patient is first affected with a sense of languor, lassitude, chilliness, followed by rigor, often very severe, causing the teeth to chatter, and the whole body to shake violently. The countenance is pale and dejected; the skin cool and corrugated—the hands and feet are particularly chilled; the nails and lips blue; the respiration is short and suspirious; the pulse small, somewhat frequent, and irregular; the tongue is clammy; and there are anorexia, epigastric uneasiness, and some headache. These symptoms of the *cold* stage gradually pass off—seldom lasting longer than two hours—and are succeeded by those of the *hot* stage; in which the skin is hot and dry, the pulse strong and full, the features flushed and turgid, the eye suffused, with increase of headache, sometimes delirium, and a dry and furred tongue, &c.

These symptoms of the *hot* stage continue for two, three, or four hours. At length a moisture breaks out on the face and neck, and

gradually extends over the whole body. The febrile symptoms then rapidly diminish; the pulse sinks to its natural standard; the feelings of weakness and oppression go off; the heat of skin, headache, and thirst abate; the appetite returns; and all the secretions are restored to their healthy condition. There is considerable variety in the duration of the paroxysm. It lasts upon an average six or eight hours; and after a certain interval, the same train of symptoms is renewed, unless checked by appropriate remedies.

Symptoms of Complicated and Malignant Intermittents.—Intermittents may, like continued fevers, become complicated with various inflammatory affections. Thus, the brain and its membranes may become involved in inflammation; in which case there will likely be severe headache, vertigo, high delirium, intolerance of light and sound, &c., followed by stupor and coma. *Secondly*, the lungs may suffer; in which case, besides the symptoms proper to the febrile state, there will be constriction, pain, dyspnœa, cough, &c. And *thirdly*, the seat of complication may be in the abdomen, when there will likely be pain or tenderness on pressure, diarrhœa, vomiting, tormina, &c.—that is, should the stomach or bowels be affected; although, perhaps, the most frequent of all the complications are those of the liver and spleen, particularly the latter; leading to hypertrophy, and permanent enlargement of that viscus.

The tendency that there is in ague towards the production of an enlargement of the spleen has been long observed, but the precise cause of this has not yet been fully ascertained. The enlargement will be marked during life by a dull weight and increasing sense of fulness in the left hypochondrium, and by occasional paroxyms of pain referable to the same region. The organ may also in some cases descend below the margin of the ribs, and be felt by the hand. This circumstance will imply a great increase of volume.

Lastly, from the organic derangements and the growing debility of the patient, dropsy not unfrequently follows as a remote consequence or *sequela* of repeated attacks of ague. Nevertheless a person living in a cold or temperate climate may continue to be affected with the disease for a very long period, without suffering from any permanent derangement of function, or from any change of structure. But it is not so in hot climates; for there, after a few paroxysms, inflammatory affections set in, and the patient is carried off by convulsions, dysentery, cholera, or other active disease.

Causes.—The predisposing causes of ague are the same as in other fevers, viz. exposure to sudden or great alternations of temperature, fatigue, anxiety, and other causes of debility. The exciting cause is *malaria;* yet in some instances the malaria is the predisposing cause—in which case one or other of the common causes of disease, above referred to, acts as the exciting cause. The *latent* period is said to extend to some months; *i. e.* a period of some weeks or months may elapse between exposure to the miasm, and the invasion of the disease.

Intermittents differ from fevers of the continued form in this

remarkable particular—that an attack of the latter confers a considerable power of resistance to its exciting causes, and for some time gives a protection to the individual against future attacks; whereas, having suffered once from the former, predisposes to repetitions, even from exposure to very slight causes.

In regard to the *proximate* cause of intermittent fever, we have only to repeat what was said in reference to fever in general—that notwithstanding the many ingenious theories which have been advanced in all ages to explain the intimate nature of the febrile movements, nothing satisfactory is yet known on the subject: we are altogether ignorant of the pathological condition of the several organs and systems of the body, in an individual labouring under this disease. The reasons for not believing it to be identical with inflammation have been already given; and several others might be added, were it necessary.

Treatment.—The treatment of intermittent fever resolves itself, 1st, into that which is proper during the paroxysm; and, 2d, into that which applies during the interval. In reference to the former, the object is to shorten the cold, and moderate the hot stage, and thus bring the paroxysm to a speedy termination. This indication will be best accomplished by the warm bath, and diluent drinks, if the patient be still in the cold stage—and by tepid sponging and a laxative, if in the hot stage; unless there should seem to be more than usual vascular excitement, or local determination of blood, when bleeding, general and local, will be required. Some, particularly Dr. Mackintosh of Edinburgh, have recommended that the paroxysm should be at once cut short by bleeding, while the patient is yet in the cold stage. Of the success of such practice I cannot speak, having had few opportunities to test it; but this able pathologist brings forward several cases in proof of its beneficial effects.

The other part of the treatment consists in administering, during the intermissions, certain substances possessed of a tonic property, so as to fortify the system against a return of the paroxysm. But such remedies will seldom be effectual, nay, in all probability will prove injurious, should any local complication exist; and, therefore, when this is known to be the case, blood-letting ought to take the precedence of these and all other measures. The sulphate of quinine, and the arsenical solution, are the two remedies of the class referred to, most deserving of confidence; particularly the former, which may be exhibited in three or four grain doses, at intervals of four or five hours—keeping the bowels at the same time gently open. Of the liquor arsenicalis, the dose is from six to ten drops, in a wine-glassful of cold water, three times in the twenty-four hours, half an hour or so after a meal. Should this medicine excite vomiting—as it is apt to do, especially if taken on an empty stomach—five or six drops of laudanum may be added to the draught.

The severer cases of the disease, *i. e.* the malignant or compli-

cated intermittents, which are met with in the south of Europe, and along the African and American coasts, will require the early use of the lancet, followed by large doses of quinine, so soon as any intermission is observed. In these cases, however, there is seldom a complete apyrexia; and after one or two paroxysms, they lapse into a fever of the remittent type, or even become continued. In the *congestive* form of the disease, it may be necessary to give stimuli, in order to bring about reaction; after which a small bleeding may be found useful, previous to the exhibition of the bark.

II. Remittent Fever.—Remittent fevers are by no means frequent in this country, unless during very hot seasons in the latter end of summer, and beginning of autumn. The remittent fever of children ("febris infantum remittens") is the only one of this type which is at all common; but it is not the product of marsh effluvia; it is in most cases sympathetic of gastric and intestinal irritations, and disordered states of the biliary function,—requiring for its removal leeches to the abdomen, occasional laxatives, and alterative doses of some mild preparation of mercury, such as the hydrarg. cum creta, and careful regulation of the diet.

The severe bilious remittents of the south of Europe, and the still severer cases of the disease which occur in the East and West Indies, styled yellow fever, jungle fever, &c. will best be understood after a careful perusal of the works of Drs. Jackson, Rush, Johnson, Bancroft, Sir William Burnet, Cleghorn, and others. We shall here merely state the leading features of the disease.

In all cases the head and abdomen seem to suffer much from local determinations of blood. Accordingly, violent delirium, and headache, incessant vomiting, at first of bilious matters, afterwards of a glairy fluid; intense heat—thirst—pain—tenderness and oppression at the epigastrium and right hypochondrium, are all prominent symptoms in the remittent fevers of warm climates. The attack is not unfrequently sudden, the patient being seized with rigor, quickly followed by severe reaction. The fever at first is usually of a high inflammatory type, and for the most part remits after twelve or eighteen hours; although in the fever of the West Indies double this time may elapse before a remission is observed.—A profuse perspiration breaks out over the whole body, the pulse at the same time falls in frequency, the thirst abates, and the delirium and vomiting cease; until after an interval of relief varying from two to four hours, the fever and all the other symptoms recur with increased violence. But should the disease proceed unfavourably, the remissions at each time become less and less distinct, whilst the debility makes rapid progress, and a low delirium sets in; followed by many other symptoms of a typhoid kind, ending in insensibility and coma. Hemorrhages not unfrequently also take place from different parts of the body, and the vomiting is incessant. At other times, however, the patient is free from delirium, the chief symptoms of distress being referable to the abdomen. The thoracic viscera may occasionally suffer from congestion. Yellowness of

the skin is observed to some extent, as well in the bilious remittents of the south of Spain, as in the fever of the West Indies; and towards the fatal termination, a black insipid fluid, having the appearance of coffee grounds, is usually discharged from the stomach. This has usually been considered as a fatal sign. The disease in its greatest severity often ends in death as soon as the fourth day, and is seldom protracted beyond the seventh; but cases of a milder description, such as happen occasionally in this country, may be prolonged for six or eight weeks.

There is a difference of opinion in regard to whether the severer kind of remittent fever, commonly called yellow fever, is always the product of malaria, and not sometimes derived from contagion; or at least propagated by contagion, though at first of malarious origin. The *latent* period of yellow fever, and bilious remittent, is seldom more than a week or ten days.

Treatment of Remittent Fever.—Both in the yellow fever of the West Indies, and in the jungle fever or bilious remittent of the East, early and free venesection is required. But to be successful, the lancet must be employed within the first few hours from the onset of the disease: and it is also to be remembered, that an epidemic occasionally arises, wherein the early symptoms are of such a typhoid character, as to hold out no prospect of benefit from blood-letting. (p. 98.) In the more ordinary cases, however—to which we have been more particularly referring in the foregoing account—blood-letting followed by mercury, so as to affect the system as speedily as possible, will offer the best chance of safety for the patient. The bowels should be kept open, but not much purged; and so soon as the inflammatory excitement has been subdued by these combined measures, and a distinct remission takes place, the sulphate of quinine may be tried in full doses,—at the same time taking care to remove any existing topical congestion, or inflammation, by local bleeding and blistering. In the *typhoid* form of the disease, as well as in the advanced stage of the former, when the blood has undergone a marked change in its physical, and probably also in its vital properties, it has been recommended to administer freely a combination of the carbonate of soda, chlorate of potash, and muriate of soda, every hour or half hour, in solution. (See p. 61.)

III. Hectic Fever.—We here notice this modification of fever, on account of its liability to be confounded with protracted remittents, or even with intermittents. Its chief characteristics are these:—a regular exacerbation every evening, (sometimes also at noon,) marked by a circumscribed flushing of the cheeks, a clear shining appearance of the eye, a hot skin, particularly a burning sensation in the hands and feet; and a full, quick pulse, commonly from 100 to 120; followed by profuse sweating about four or five in the morning, with much abatement of the febrile symptoms, but not complete apyrexia. There is little complaint of thirst. The appetite is often little if at all impaired. The body gradually

wastes; and the debility is progressive. There are no spasms, and no affection of the intellectual functions; and, for the most part, the patient entertains a confident expectation of recovery up to a late period of the disease, in some cases almost to the last moment. In other instances, however, delirium comes on two or three days before death. Diarrhœa also is frequently observed to alternate with the colliquative sweats, as the emaciation and debility proceed; and in which case the tongue is apt to become aphthous, or very red, smooth, and glossy. Finally, anasarcous swellings of the feet and ancles, and other dependent parts of the body, often supervene, when the debility has become very great.

Hectic fever is believed to be always a *symptomatic* disease. It is an attendant upon long continued irritations of vital organs, extensive suppurations, softening of tubercular and carcinomatous deposits. &c. The treatment will, therefore, in a great measure depend upon our knowledge of the seat and nature of the local disease whence the fever springs, but which in a great many cases will be found to be irremediable; so that the treatment of hectic fever is for the most part only palliative.

EXANTHEMATA, OR ERUPTIVE FEVERS.

The bronchial mucous membrane, the lining membrane of the stomach and intestines, and the external skin, are continuous with each other: they perform functions of the same character, and sympathise with each other's state in health and in disease. Accordingly we find, at the commencement, and throughout the course of the febrile exanthemata, that there is very generally an active congestion or determination of blood—not unfrequently amounting to inflammation—of the mucous membrane, but more particularly of that portion of it which lines the mouth, fauces, nasal passages, and bronchiæ. This affection of the mucous membrane is, indeed, the chief source of danger in the diseases we have now to notice, and consequently, both in a pathological and remedial point of view, ought to engage much of the attention of the physician.

In the first place, then, the eruptive fevers differ from the idiopathic fevers, already described, in being associated with inflammation of the skin and mucous membranes,—the inflammation in both being considered to be of a specific kind. Secondly, they have a considerably shorter duration. Thirdly, they are characterised by a more definite succession of symptoms—the cutaneous inflammation or efflorescence being always ushered in by a distinct febrile attack, which greatly abates or entirely subsides after the eruption has come fully out. And lastly, they differ from common continued fever in this circumstance, that, with very few exceptions, they attack the same individual only once. In a great majority of cases

we find these eruptive fevers assuming the inflammatory type; yet, in some epidemics they are distinctly typhoid. It may be remarked, however, that not only is the former the most prevailing character of the fever, but also that it makes a nearer approach to the *synocha*, than is usually observed to be the case in the non-eruptive or common continued fevers. Blood-letting is upon the whole, therefore, better sustained, and generally more productive of beneficial results, in the former, than in the latter.

The genuine exanthemata are, 1st, Scarlatina; 2d, Measles; 3d, Small-pox; and 4th, Chicken-pox. In all of these, the symptoms are much more regular than in those cutaneous affections which some classify under the head of the Minor Exanthemata, viz. certain of the varieties of urticaria, roseola, lichen, and herpes; which, though attended with some degree of fever, cannot be brought under any regular or fixed laws, and are besides of non-contagious origin. Some authors consider plague and erysipelas as belonging to the exanthemata; but although erysipelas does occasionally arise from contagion, this is certainly not its common origin; and besides, it is much less regular in its course than either of the above, and need not therefore be considered at the present time.

RUBEOLA.

Measles in its ordinary and mild form has been styled Rubeola Vulgaris. It is ushered in by a fever of the inflammatory kind, which is seldom so intense, however, as the fever of scarlatina. Along with the fever, there are symptoms of catarrh,—the conjunctiva is suffused and watery; the patient has frequent sneezing, dry tickling cough, with headache, and sense of stricture across the chest; the voice is somewhat raucous; and there is considerable cerebral oppression, and a feeling of drowsiness. On the fourth day of the fever, the rash makes its appearance; first on the face and neck, in the form of small red spots, afterwards extending to the breast and back, and rest of the body. The spots coalesce, and form into patches of various sizes, of a crescentic shape, slightly raised above the surrounding surface; so that when the eruption is fully out, the skin feels rough when the hand is passed over it. By the seventh day, the rash has faded, and by the eighth or ninth, has wholly disappeared. The cuticle seldom exfoliates so extensively as it does in scarlatina; it becomes, however, furfuraceous.

The semi-lunar form of the patches of eruption, its darker colour, its elevation above the surrounding surface, and consequent roughness of the skin,—the catarrhal symptoms, particularly the suffused watery eye,—and the comparatively trifling affection of the throat —are sufficiently diagnostic of the measles, and will prevent us

from confounding it with scarlatina, or with roseola. At the same time it must be confessed, that cases do sometimes occur wherein the diagnosis is less obvious.

The affection of the mucous membrane is considered, like that of the skin, to be specific. The parts of it which are most apt to suffer from congestion and inflammation in the course of the measles are —the conjunctiva, the schneiderian, the laryngeal, tracheal, and bronchial membrane; the substance of the lungs is sometimes affected, and more rarely the pleura. The stomach and bowels, or the brain and its membranes, may also occasionally be the seat of inflammation. For the symptoms denoting the presence of these thoracic, encephalic, or abdominal complications, see page 101, *et seq.* Chronic inflammations of the brain, lungs, and intestines, are amongst the more serious of the remote consequences or *sequelæ* of measles—more particularly of the lungs, ending in tubercular phthisis.

Rubeola sine Catarrho.—Rubeola is said to have occurred sometimes without those catarrhal symptoms which form so prominent a feature of the disease in its common form. Such cases have accordingly been styled "Rubeola sine Catarrho." There is rarely any danger arising from it; and no particular treatment is required. It does not exempt from an attack of the rubeola vulgaris.

Rubeola Nigra.—The rash is in some epidemics unusually dark-coloured, when there is not unfrequently, also, a typhoid type of fever; though in this event it is more properly styled the rubeola maligna, seu typhodes. This form of the disease is, however, by no means of frequent occurrence. It prevailed extensively in Edinburgh, in 1816, assuming in many of the cases a very adynamic character. (See Ed. Med. and Surg. Journal for 1817.)

Treatment of Measles.—In the generality of the cases of measles of a mild character, nothing in the way of treatment will be required beyond a few gentle doses of laxative medicine, confinement to a well-ventilated room of the temperature of 55 or 60°; and abstinence from animal food. Leeches or a small bleeding may be requisite when the child is threatened with any topical determination of blood, or when the catarrhal symptoms are more than usually severe. Diarrhœa happening towards the conclusion of the disease is not unfavourable, unless it be allowed to proceed so far as greatly to weaken the child, and threaten collapse. But when diarrhœa occurs on the first day or two of the eruption, the progress of the rash is checked, and the breathing generally becomes oppressed. Such an occurrence is usually connected with a congested condition of the intestinal mucous membrane; and requires leeching to the abdomen, followed by the tepid bath, and friction with a stimulating liniment to the abdomen and chest, or a small blister; together with two, three, or four grains—according to the age of the patient—of compound powder of ipecacuan, or a little chalk mixture, with a few drops of tinture of kino.

For the principles of treatment applicable to the severe inflam-

matory cases of the disease, and the symptoms denoting the several complications, see page 100, *et seq.* And for the principles of treatment applicable to the typhoid, and the rare congestive form of measles, see page 96. We would here merely observe, that, in these latter cases, the object is to bring about a reaction, and keep out the rash, whereby the internal organs are relieved. A gentle emetic, should there be no great cerebral oppression, and the hot bath, with salt dissolved in the water, followed by friction, will be the best and safest remedies: leeches to the head and chest, or a small bleeding, and a dose of calomel, will be proper, where the case is seen very early, and the patient is tolerably robust. But in the worst kind of cases, wine, or small quantities of brandy, and ammonia, will be required, in order to bring about a reaction; and small quantities of nourishing food must be given at short intervals throughout the disease.

SCARLATINA.

Scarlatina occurs under three forms. In the first, which is the mildest and most common form, the efflorescence is ushered in and accompanied throughout with a moderate degree of fever of the inflammatory type; and there is only a slight inflammation of the fauces—hardly, indeed, amounting to inflammation. This is the "*Scarlatina Simplex*" of authors. The second is the "*Scarlatina Anginosa*," in which the fever is inflammatory, as in the former instance, but more intense, and attended with a much more acute affection of the throat. The third is the low or typhoid form of the disease, commonly called the "*Scarlatina Maligna;*" in which there is either no eruption—the principal topical affection being situated in the throat, which rapidly falls into a state of gangrene; and in which case the disease has obtained the name of "*Cynanche Maligna:*" or if there be an eruption, it is of a fainter and more dusky colour than usual, and soon disappears.

Scarlatina Simplex.—The first symptoms of sickening are those common to all febrile diseases, viz. muscular debility, general weight and oppression, languor, lassitude, and chilliness; which are soon succeeded by a full and frequent pulse, heat of skin, &c. The heat in the more inflammatory form of the disease often rises to 105 and 107. Delirium is not unfrequently observed, especially in young children, just before the appearance of the rash. This symptom, however, indicates no particular danger, unless it be of some continuance. On the second day of the fever, the efflorescence usually makes its appearance, consisting of a number of small bright scarlet spots which cover the skin so closely, as to present in many parts a continuous blush. The eruption is first perceived on the face, neck, and breast; and in the course of twenty-four hours

thereafter, it is diffused over every part of the skin;—pervading, at the same time, the mucous lining of the mouth, throat, and nares. On the fifth day it begins to decline, and has in general faded away by the seventh, leaving the cuticle in a state of partial desquamation. During the height of the disease, the tongue is white in the centre, and highly florid on the edges—the papillæ being elongated, and turgid with blood. The whole surface of the body is at the same time somewhat tumefied, particularly the integuments of the face. This form of scarlatina is not often fatal.

Scarlatina Anginosa.—In this form of the disease the febrile symptoms are very intense, while the affection of the throat is also very severe—being highly inflammatory, and rapidly ending in ulceration, unless moderated at an early stage by blood-letting, and other appropriate treatment. There is consequently much swelling of the tonsils, velum pendulum palati, and uvula; with painful and difficult deglutition, and impeded respiration. And there is often much swelling of the parotid, submaxillary and common lymphatic glands of the neck. The inflammation moreover is apt to extend to the larynx and bronchiæ, on the one hand; and to the pharynx, stomach, and intestines, on the other,—giving rise to cough, dyspnœa, pain or constriction of the chest; or to vomiting, diarrhœa, dysentery, &c. Or the head may become affected, and then we shall have headache, intolerance of light and sound, delirium, pervigilium, restlessness, &c., followed by stupor and coma. The rash is commonly somewhat later in appearing, stays out longer, is of a deeper hue, less diffused, and more in patches, than in the scarlatina simplex. Extensive exfoliations of the cuticle take place about the ninth day; to which not unfrequently succeeds anasarca or ascites—more commonly the former—and which in this case is very generally an acute or inflammatory dropsy, requiring a combination of antiphlogistic measures, with digitalis or squill, for its removal. (See page 72.) In other cases, again, a rheumatic affection assails the joints; but the former is the more common *sequela* of scarlatina.

Scarlatina Maligna.—In the scarlatina maligna, the rash appears much later than in either of the preceding forms, if indeed it appear at all. It not unfrequently appears for an hour or two towards evening, when there is an exacerbation of the fever, and afterwards recedes: it is of a faint dusky hue, with sometimes an intermixture of petechiæ. The fever is typhoid. The heat of skin is unsteady, and in very bad (adynamic) cases, it is often not above the natural standard, and low delirium and stupor quickly supervene. The countenance is dejected, and the pulse is small, frequent, and easily compressed; whilst the tongue becomes dry, brown, and contracted, or red and glossy. In many cases, also, there is an early tendency to diarrhœa, which is apt soon to be followed by a general collapse. But in some instances, and in some epidemics, the local affection is chiefly if not entirely confined to the throat, no rash appearing: this, we have already said, con-

stitutes the cynanche or angina maligna, of various authors. The mucous membrane of the fauces is of a dark-red colour, and quickly forms into ulcers, covered by grayish-coloured sloughs; from which an acrimonious fluid is discharged, as also from the nostrils. The breath is highly fetid; and the bowels and stomach become very irritable, partly, it is believed, although not entirely, on account of the escape of the acrid fluids into the stomach. There is at the same time always much embarrassment in the breathing.

It is hardly necessary to observe, that this modification of scarlatina is very generally fatal; the patient is carried off sometimes as soon as the third or fourth day. It is fortunately, however, not a common form of the disease. It is only at considerably distant periods of time that an epidemic of this sort is observed to arise.

Treatment of Scarlatina.—In the scarlatina simplex it is not necessary to do more than has been recommended in the case of rubeola vulgaris. But as the eruptive fever is generally more severe in the former than it is in the latter, and the heat of skin greater—at the same time that the risk of pulmonary inflammation is less—the apartment should be kept very cool, a free circulation of air allowed, cooling drinks administered, occasional aperients prescribed, and the surface of the body sponged frequently with cold water: and in plethoric children, a bleeding may be practised with advantage. In the scarlatina anginosa, the cold sponging should be frequently employed; general bleeding will also be indispensable, and this should be repeated when the case is seen early, when the fever runs high, and the inflammatory symptoms are urgent. As the throat is the part which suffers most, in the first periods of the disease, leeches should be freely applied to the lateral parts of the external fauces, or behind the ears; frequently inhaling, at the same time, the vapour of warm water, and using mild detergent gargles. In this form of the disease, also, brisk purgatives may be given with much advantage during the early stage—guarding against intestinal irritation by discontinuing them whenever they appear to excite tormina, meteorismus, and watery or mucous stools. In the late stage of the disease, the system will require to be supported by some mild nourishment, such as thin sago or arrow-root, to which may be added a little wine, should the debility be very great. In young children a little sack-whey, made by adding three or four tea-spoonfuls of white wine to two or three ounces of warm milk, will be found a very useful remedy under such circumstances.

Since the pathology of the scarlatina maligna resembles that of adynamic fever in most particulars—with this important exception, however, that in the former the mucous membrane, lining the posterior fauces, nares, and pharynx, suffers from inflammation, which quickly ends in gangrene—the student may be referred to pages 95 and 96 for the *general* principles which ought to guide him in the treatment of such a case. We shall only here advert to one or two particulars connected with the affection of the throat.

Although inflammatory action does assuredly exist in those parts of the mucous membrane to which we have just referred, extending, in many cases, to the larynx and pharynx, general bloodletting, we believe, can seldom be adopted to any extent, unless in robust subjects, and within the first few hours from the onset. Local bleeding should, however, be employed, followed by blisters behind the ears; and the fauces should be touched from time to time with a weak solution of nitrate of silver, when sloughs are forming. Some practitioners recommend a gargle composed of ten or twelve grains of capsicum, infused in six or eight ounces of water, to which is added an ounce of vinegar; while an acidulated infusion of cinchona is made use of by others, or a solution of chloride of soda. The inhalation of the vapour arising from warm water will be found most beneficial during the short inflammatory stage. The system will require to be supported from an early period by small but frequent allowances of mild food; and the carbonate of ammonia may be given, with some aromatic mixture. (See Note, p. 49.) In the severe congestive form of the disease, it will be proper to pursue a course of treatment similar to what has been recommended for the most malignant cases of measles. (P. 116.)

During the period of convalescence from scarlatina, and for some time thereafter, the whole body should be well clothed with flannel, and exposure to a cold moist atmosphere carefully avoided, particularly so long as the cuticle is desquamating,—otherwise dropsy may supervene.

VARIOLA.

Like the two preceding affections, smallpox is of various degrees of intensity; and, therefore, according to the severity of the febrile actions, and the amount and form of the eruption, it has been described under the name of the *Variola Discreta*, or distinct smallpox, and the *Variola Confluens*, or confluent smallpox. The *Varicella* or chicken-pox is by some considered as another modification of the disease; but as this position is not yet satisfactorily proved, we shall notice it separately. The *modified* smallpox, or that form of the disease which occurs after a previous attack, or after vaccination, need not, we think, be particularly considered in this place; because it differs in nothing from the variola discreta, whose leading characters we are about to notice, save in the greater mildness of all the symptoms, and the shorter course of the eruption.

Variola Discreta.—This, like the other exanthemata of which we have already spoken, is ushered in by a fever, which commonly makes its attack somewhat suddenly, with rigor or chilliness, much languor, pain of back, head, and loins; followed by vomiting and

much gastric uneasiness: Delirium or convulsions are also not unfrequent precursors of the eruption in young children. These symptoms are soon succeeded by reaction; and on the fourth day of the fever, the eruption usually makes its appearance, first on the face and upper parts of the body; and by the next day, the whole skin is covered with a number of small, red, hard papulæ, which are tender to the touch. After this the febrile symptoms greatly abate. These papulæ are distinct and separate from each other, unless on the face, where they are often set in clusters; while, at this early stage, the intervening portions of the skin are of the natural colour. These papulæ gradually enlarge; and about the fourth day from their first appearance, they are found to contain a little turbid fluid, and to have a distinct depression in their centre. Each pustule (for the eruption has now this character) becomes surrounded by a red-coloured areola, which gradually increases in circumference as the pustule enlarges, so as at length to give to the whole skin a red and inflamed appearance; particularly so on the face, where the eruption is most crowded, often indeed confluent, even in this mild form of the disease. About this period—namely the fourth or fifth day of the eruption, and eighth or ninth of the fever—the surface of the body is much swollen, particularly the integuments of the face, the eye-lids being closed from the extent of the swelling; at the same time there is usually an increased flow of saliva. On the seventh day, that is, the eleventh from the attack, the depression has disappeared from the centre of the pustules; and they are of a globular shape, filled with matter. And now the disease has reached its acme, when there is commonly an accession of febrile symptoms, constituting what has been termed the *secondary* fever, or fever of *maturation*. It is, however, slight in the variola discreta, and remits in a few hours. After this period all the symptoms decline—the pustules burst, part of their contents escapes, and, drying, forms a blackish crust or scab; while the matter contained in others of them is absorbed, after which the raised cuticle falls flat, and becomes shriveled. By the one process or the other, the whole of the pustules are emptied of their contents, about the eleventh day of the eruption, or fifteenth from the attack; and by the twentieth day, the scabs have nearly all separated, leaving such parts of the skin as formed the base of each pustule of a brownish-red colour, hard, and frequently also pitted. In this form of the disease, a few scattered pustules may generally be seen situated on the tongue and fauces; but being neither numerous, nor extending to the larynx, no great dyspnœa is occasioned, and no serious impediment offered to deglutition, as happens in the severer form of the complaint, to which we are about to advert. There is only some huskiness, with expectoration of a tough mucus, about the height of the disease.

Variola Confluens.—In the confluent smallpox the eruptive fever is much more severe, and is often ushered in with convulsions, delirium, stupor, severe vomiting, and much epigastric unea-

siness and oppression. The eruption commonly appears on the third day, but is not succeeded by the marked remission of the febrile actions observable in the mild form of the disease. The pulse remains frequent, and becomes small and irregular; and the quantity of eruption is so great that many of the pustules touch each other, and at length coalesce. Neither are they full and rounded as in the distinct smallpox, but small and of an irregular shape; while in very bad cases, where the reaction is feeble, they are pale, and become flat and shrunk on the fifth or sixth day, never having properly maturated. They are not surrounded by rose-coloured areolæ as in the mild disease; but the spaces unoccupied by eruption are pale, flaccid, and doughy. The lower extremities are very often attacked with an erysipelatous inflammation, extending to the subcutaneous cellular tissue: more rarely petechiæ and other hemorrhages occur. The mucous membrane of the mouth and fauces is loaded with eruption, which often penetrates to the pharynx and larynx, greatly impeding respiration and deglutition. The patient is now threatened with suffocation, in consequence of the extensive swelling of the structures about the neck and throat—the tonsils, the larynx and pharynx, the salivary and conglobate glands, &c.; and in consequence, also, of the accumulation of a tough mucus in the back part of the fauces and trachea. In some instances the patient's death is chiefly owing to the swelling which takes place around the glottis, ending in occlusion of the rima. But in other cases, again, a diarrhœa comes on, followed by sudden collapse; or the patient is carried off by an inflammation of the pleura, or membranes of the brain, which has speedily ended in effusion. Should he, however, survive till the fifth or sixth day of the eruption, (the ninth from the invasion of the disease,) he is sure to have a severe accession to the febrile symptoms, followed, very likely, by delirium, subsultus, dyspnœa, stupor, &c.

In the event of the patient surviving this formidable attack, it will be long before he regain his strength. The face is certain to be marked by scars and deep pittings; not unfrequently, indeed, he is reduced to a state of blindness; and is harassed by a succession of swellings and suppurations of the lymphatic glands, or by the separation of large sloughs which had formed over the sacrum, nates, or extremities, during the latter stages of the disease.

Treatment.—The primary indication in the treatment of smallpox consists in moderating the violence of the eruptive fever, so as to diminish the quantity of the eruption, for on this depends in no small degree the safety of the patient. Accordingly, as soon as the eruptive fever has commenced, a strict antiphlogistic regimen should be enjoined, and the surface kept cool by frequent sponging with cold or tepid water, free ventilation, and light coverings. At this early stage of the disease the bowels should be well opened, and in a majority of cases a general bleeding may be advantageously practised. Nothing more will be required after the eruption

has made its appearance, than an occasional laxative—unless the local inflammations are urgent—until about the period of maturation, when the patient, in consequence of the exacerbation or accession of febrile symptoms, is apt to become very restless and sleepless, and sometimes even delirious. A dozen or two of leeches should then be applied to the temples, cold to the shaven scalp, and hot fomentations to the extremities; at the same time an opiate draught, containing twenty-five or thirty drops (to an adult) of the liquor opii sedativus, and ten or fifteen of the vinum ipecacuanhæ, may be administered for two or three nights in succession, followed in the morning by a dose of castor oil. This is a practice which I have found very beneficial in some rather severe cases of the disease. At this stage, also, a little farinaceous food may be allowed, or very weak chicken soup.

But although active depletion by the lancet will be highly proper, when local inflammations make their appearance *early* in the eruptive stage of the smallpox, general bleeding, to any great extent at least, will be of very doubtful efficacy after the eruption has fully come out, and the vesicles are well advanced towards maturation; particularly if they be confluent. Leeching must then take the place of general bleeding, and it will be proper to avoid drastic purgatives. The *secondary* fever, or stage of maturation, is, however, the period when danger is most to be apprehended, since any inflammatory affection already existing is then liable to be aggravated, whilst others are called into existence; and now it is that we have the greatest difficulty in determining how far a general bleeding can be practised with ultimate safety and benefit to the patient. As a general rule it may be stated, that unless the inflammatory action is urgent, and the febrile excitement at the same time much developed, it will be better to apply leeches in such numbers as will be sufficient to produce a decided impression on the local symptoms, and to repeat them once and again according to the effect produced. The head, throat, and chest, are the parts which in the course of the disease are most likely to be attacked with inflammation, particularly the latter. In the event, therefore, of cough, dyspnœa, and other symptoms of thoracic inflammation, appearing about the time of maturation, leeches should be applied in numbers around the external fauces, and to the upper part of the sternum, followed by fomentations, and if necessary, a blister—not allowing it, however, to remain on long, for fear of sloughing. When the fever declines, and a collapse threatens, a little wine, and a mixture containing carbonate of ammonia, will be required.

In the worst or *congestive* form of variola, little can be done to save the patient. The principles of treatment are similar to those recommended in scarlatina maligna.

VARICELLA.

Dr. Thomson of Edinburgh and some others consider this affection to be merely a mild variety of smallpox; and treat of it accordingly under the head of *varioloid* diseases. It properly consists of three varieties—the conoidal, the lenticular, and the globular varicella. The eruption in a case of varicella is preceded for a day or two by febrile disturbance, which is often, however, so slight as to escape observation. The eruption consists of successive crops of separate and distinct transparent vesicles; commencing first on the back or breast, afterwards appearing on the face and head, and finally on the extremities. The vesicles gradually become distended with lymph; exhibit no depression in their centre; have no indurated base, nor cellulated structure, as in genuine smallpox; and about the fifth day after their appearance they break, and become covered with thin scabs, which drop off much sooner than in smallpox, and rarely leave any permanent cicatrices or pittings. They are not observed to be confluent, seldom more than ten or twelve being seen on the face—a part where, even in mild cases of variola, the eruption is not unfrequently confluent.

The treatment of varicella is very simple. Nothing more in general will be required than a mild antiphlogistic regimen, with an occasional laxative, and confinement to the house for a day or two. Sometimes, however—especially in children of the strumous constitution—bronchitis and other inflammatory affections supervene.

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